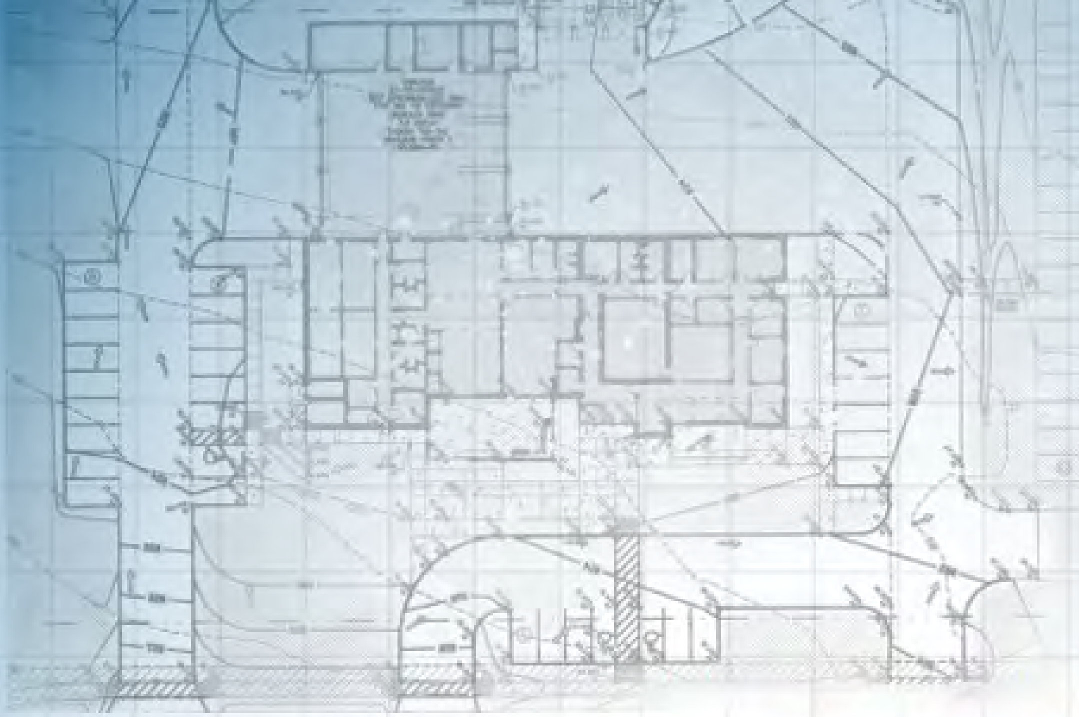

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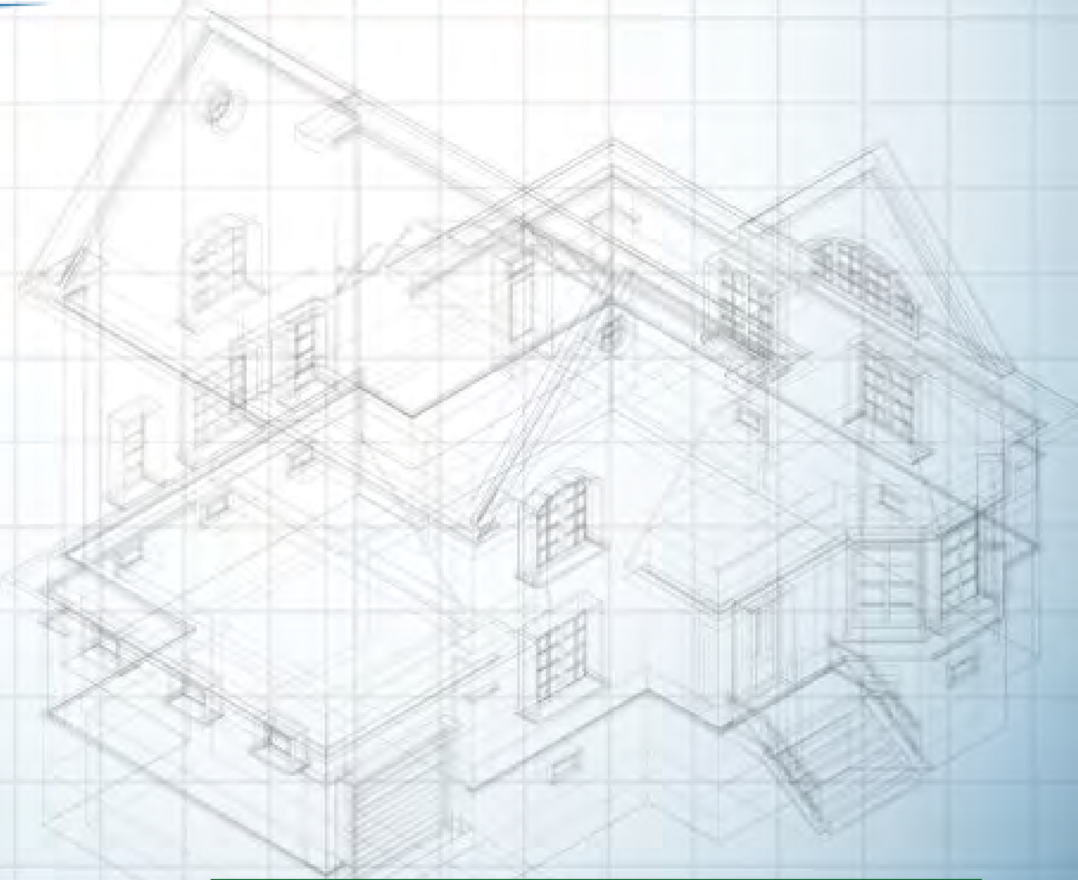

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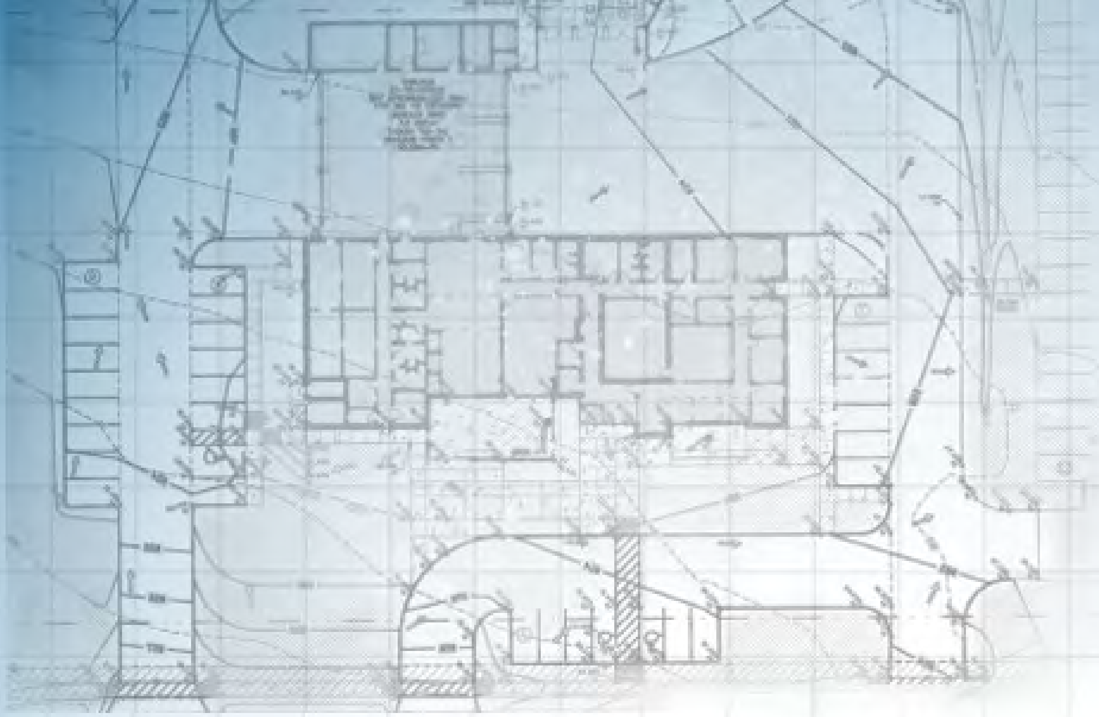

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SECTION 01300 - SUBMITTALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal Procedures

B. Construction Progress Schedules

C. Product Data

D. Shop Drawings

E. Samples

F. Design Data

G. Test Reports

H. Certificates

I. Manufacturer’s Instructions

J. Manufacturer’s Field Reports

K. Erection Drawings

L. Required Submittals and Shop Drawings

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control: Manufacturer’s field services and reports.

1.3 SUBMITTAL PROCEDURES

A. Transmit each submittal with AIA Form G810 or City of Longview accepted form.

B. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Developer/Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate.

D. Apply Developer/Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and deliver to the project’s Engineer of Record at business address. Coordinate submission of related items.

F. For each submittal for review, allow fifteen (15) working days, excluding delivery time to and from the Developer/Contractor.

G. Identify ALL variations from the City of Longview standards and Approved Products or system limitations which may be detrimental to successful performance of the completed Work. Variations will require City of Longview's approval.

H. Provide space for Developer/Contractor and Engineer's review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute copies of reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

1.4 PRODUCT DATA

A. Product Data for Review:

   1. Submitted to the project's Engineer of Record for review for the limited purpose of checking for conformance with information given and the design concept expressed in the Plans and construction standards.

   2. After review, provide copies and distribute in accordance with Submittal Procedures article above.

B. Product Data for Information:

   1. Submitted for the Engineer of Record's knowledge.

C. Product Data for Project Closeout:

   1. Submitted for the Engineer of Record's benefit.

D. Submit the number of copies which the Developer/Contractor requires, plus three (3) copies which will be retained by the Engineer of Record for the project.

E. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

F. Indicate Product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.5 SHOP DRAWINGS

A. Shop Drawings for Review:

   1. Submitted to the Engineer of Record for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

2. After review, produce copies and distribute in accordance with Submittal Procedures article above.

B. Shop Drawings for Information:

1. Submitted for the Engineer of Record's knowledge.

C. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

1.6 DESIGN DATA

A. Submit for the Engineer of Record's knowledge.

B. Submit for information for the limited purpose of assessing conformance with information given and the design concepts.

1.7 TEST REPORTS

A. Submit for the Engineer of Record's knowledge.

B. Submit test reports for information for the limited purpose of assessing conformance with information given and the design concepts.

1.8 CERTIFICATES

A. When specified in individual specification sections, submit certification by the manufacturer, installation/application subcontractor, or the Developer/Contractor to Engineer of Record.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Product, but must be acceptable to City of Longview.

1.9 REQUIRED SUBMITTALS AND SHOP DRAWINGS: Submittals and/or Shop Drawings shall be submitted on the following items, as appropriate, for approval. The omission of any work item requiring a submittal to be furnished to the Engineer of Record prior to use in this project does not relieve the Developer/Contractor from responsibility for making all required submittals.

A. Pipe & Fittings - All Types

B. Valves - All Types

C. Manhole Frames and Covers

D. Meter Boxes

E. Lime

F. Concrete Mix Design for Each Class of Concrete

G. HMAC Mix Design for Each Class of HMAC

H. Reinforcing Steel

I. Paint

J. Reinforced Concrete Pipe (HDPE Drainage Pipe)

K. Signs

L. Prime Coat and Tack Coat

M. Pre-Cast Manhole Sections

N. Non-Shrink Grout

O. Erosion Control Matting

P. Geofabrics

Q. Seed, Fertilizer and Mulching Materials

R. Trees, Shrubs, and Miscellaneous Planting Materials

S. Sieve Analysis of All Embedment and Foundation Material

T. Filter Fabric Fence

U. All Electrical

V. All Architectural

W. Brick Pavers

X. All Signalization

Y. Other Materials Required in the Technical Specifications

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01400 - QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality Assurance - Control of Installation

B. Tolerances

C. References and Standards

D. Inspection and Testing Laboratory Services

E. Manufacturers' Field Services

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Schedule of construction materials testing, laboratory qualifications, test results.

1.3 QUALITY ASSURANCE - CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from City of Longview before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of Products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer of Record before proceeding.

C. Adjust Products to appropriate dimensions; position before securing Products in place.

1.5 REFERENCES AND STANDARDS

A. For Products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of the Engineer of Record or the City of Longview shall be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.6 INSPECTION AND TESTING LABORATORY SERVICES

A. Employ and pay for specified services of an independent firm to perform testing for verification of compliance to contract document.

B. The independent firm will perform tests and other services specified in individual specification sections and as required by the City of Longview.

C. Testing and source quality control may occur on or off the project site. Perform off-site testing as required by the City of Longview.

D. Reports will be submitted by the independent firm to the Engineer of Record or the City of Longview and Developer/Contractor, in duplicate, indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

   1. Notify City of Longview and independent firm 24 hours prior to expected time for operations requiring services.

   2. Make arrangements with independent firm and pay for additional samples and tests required for Developer/Contractor's use.

F. Testing does not relieve Developer/Contractor to perform Work to contract requirements.

G. Re-testing required due to non-conformance with specified requirements shall be performed by the same independent firm, and as instructed by the Engineer of Record.

H. The Owner shall be responsible for paying for tests indicating conformance with specified requirements has been met. The Developer/Contractor shall be responsible for testing charges incurred as a result of failed tests and will be billed directly to for such charges.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specifications sections.

D. Verify that utility services are available, of the correct characteristics and in the correct locations.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

END OF SECTION

SECTION 01410 - TESTING SERVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selection and Payment

B. Quality Assurance

C. Agency Responsibilities

D. Agency Reports

E. Limits on Testing Authority

F. Developer/Contractor Responsibilities

G. Schedule of Tests

1.2 RELATED SECTIONS

A. Section 01300 - Submittals: Manufacturer's certificates.

1.3 REFERENCES

A. ASTM C802 - Practice for Conducting an Interlaboratory Test Program to Determine the Precision of Test Methods for Construction.

B. ASTM C1021 - Practice for Laboratories Engaged in the Testing of Building Sealants.

C. ASTM C1077 - Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation.

D. ASTM D290 - Recommended Practice for Bituminous Mixing Plant Inspection.

E. ASTM D3740 - Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.

F. ASTM D4561 - Practice for Quality Control Systems for an Inspection and Testing Agency for Bituminous Paving Materials.

G. ASTM E329 - Practice for Use in the Evaluation of Inspection and Testing Agencies as Used in Construction.

H. ASTM E543 - Practice for Determining the Qualification of Nondestructive Testing Agencies.

I. ASTM E548 - Practice for Preparation of Criteria for Use in the Evaluation of Testing Laboratories and Inspection Bodies.

J. ASTM E699 - Practice for Criteria for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating Building Components in Accordance with Test Methods Promulgated by ASTM Committee E6.

1.4 SELECTION AND PAYMENT

A. Employ and pay for services of an independent testing agency or laboratory to perform specified testing.

B. Employment of testing agency or laboratory in no way relieves Developer/Contractor of obligation to perform Work in accordance with requirements of the City of Longview.

1.5 QUALITY ASSURANCE

A. Laboratory: Authorized to operate in State in which Project is located.

B. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.

C. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to either National Bureau of Standards or accepted values of natural physical constants.

1.6 AGENCY RESPONSIBILITIES

A. Test samples of mixes submitted by Developer/Contractor.

B. Provide qualified personnel at site. Cooperate with the Engineer of Record representative(s) and Developer/Contractor in performance of services.

C. Perform specified sampling and testing of Products in accordance with specified standards.

D. Ascertain compliance of materials and mixes with requirements of the City of Longview.

E. Promptly notify the Engineer of Record and Developer/Contractor of observed irregularities or non-conformance of Work or Products.

F. Perform additional tests required by Engineer.

G. Attend preconstruction meetings and progress meetings.

1.7 AGENCY REPORTS

A. After each test, promptly submit two copies of report to the Engineer of Record and the City of Longview and to Developer/Contractor.

B. Include:

1. Date Issued
2. Project Title and Number

3. Name of Inspector
4. Date and Time of Sampling or Inspection
5. Identification of Product and Specifications Section
6. Location in the Project
7. Type of Inspection or Test
8. Date of Test
9. Results of Tests
10. Conformance with Contract Documents

C. When requested by the City of Longview, provide interpretation of test results.

1.8 LIMITS ON TESTING AUTHORITY

A. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of City of Longview.

B. Agency or laboratory may not approve or accept any portion of the Work.

C. Agency or laboratory may not assume any duties of Developer/Contractor.

D. Agency or laboratory has no authority to stop the Work.

1.9 DEVELOPER/CONTRACTOR RESPONSIBILITIES

A. Deliver to agency or laboratory at designated location, adequate samples of materials proposed to be used which require testing, along with proposed mix designs.

B. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.

C. Provide incidental labor and facilities:

1. To provide access to Work to be tested.
2. To obtain and handle samples at the site or at source of Products to be tested.
3. To facilitate tests.
4. To provide storage and curing of test samples.

D. Notify the Engineer of Record and laboratory 24 hours prior to expected time for operations requiring testing services.

1.10 SCHEDULE OF TESTS

A. Individual Specification Sections: Tests required and standards for testing.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01550 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This item shall consist of providing, installing, moving, replacing, maintaining, cleaning, and removing upon completion of work all barricades, signs, barriers, cones, lights, signals, and such type devices and of handling traffic as indicated in the City of Longview approved traffic control plan or as directed by the City of Longview.

1.2 REFERENCES

A. Texas Manual on Uniform Traffic Control Devices (TMUTCD). RELATED SECTIONS

B. Section 01300 - Submittals: Traffic Control Plan, phasing, devices.

1.3 QUALITY ASSURANCE

A. All barricades, signs, and other types of devices listed above shall conform to details shown in the plans or those indicated in the TMUTCD.

B. Prior to beginning work, the Developer/Contractor shall designate a competent person responsible and available on the project site or in the immediate area to insure compliance with traffic control requirements.

C. The Engineer will designate a qualified person to observe implementation, and who will have authority to assure compliance with TMUTCD.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 PREPARATION

A. Barricades, signs, and traffic handling devices shall be installed and maintained in accordance with the approved traffic control plan. These devices shall be maintained throughout the duration of the project unless otherwise approved by the Engineer.

B. Developer/Contractor shall be responsible for coordination any traffic flow modification with City and/or State officials, including but not limited to the Police Department, Fire Department, and the 9-1-1 Network Emergency Communications.

END OF SECTION

SECTION 01552 - STORM WATER POLLUTION PREVENTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The Work to be performed under this Section shall consist of furnishing all permits, notice of intent, notice of termination, labor, equipment, materials, and pay all permit fees as necessary to meet the requirements of the Texas Pollution Discharge Elimination System (TPDES) associated with construction activities under TPDES Construction General Permit TXR150000 for storm water pollution prevention as required by current Federal, State, and Local rules and regulations.

1.2 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.

B. The following items shall be submitted for record purposes:

1. Storm water pollution prevention plan,
2. Notice of Intent (NOI),
3. Photocopies of permit application fee payment(s), and
4. Notice of Termination (NOT).

1.3 GENERAL PERMIT, APPLICATION, AND FEES

A. The Developer/Contractor shall bear sole responsibility for the storm water pollution prevention provisions of this Contact. As well as bear sole responsibility for implementation, and maintenance of the storm water pollution prevention plan, the best management practices, and the facilities utilized to meet the TPDES General Permit requirements. The storm water pollution prevention plan and Notice of Intent shall be completed prior to beginning any work or stockpiling of materials.

B. Prior to filing the Notice of Intent, the Developer/Contractor shall develop and submit a Project specific storm water pollution prevention plan based on best management practices that includes all aspects as required by current Texas Commission on Environmental Quality (TCEQ) and US Environmental Protection Agency (USEPA) rules.

C. After submittal of a Project specific storm water pollution prevention plan as required by TXR150000, the Developer/Contractor shall file the Notice of Intent (NOI). A copy of the NOI shall be submitted to the City of Longview for record purposes.

D. The Developer/Contractor shall pay all fees associated the TPDES permit application as well as any renewal fees if applicable. A photocopy of the payment shall be submitted to the City of Longview.

E. The Developer/Contractor shall pay all costs associated with the development of the storm water pollution prevention plan as well as the implementation, maintenance, monitoring, and inspection of the storm water pollution prevention plan facilities during the construction period.

F. Upon closeout of the Project, the Developer/Contractor shall submit at Notice of Termination (NOT) to the TCEQ using the proper form and provide a copy to the City of Longview or record purposes.

1.4 PROJECT REGULATORY REQUIRMENTS

A. Construction General Permit (CGP TPDES No. TXR150000) requirements are based on the area disturbed by the construction activities as follows:

1. Projects disturbing five (5) or more acres.
2. Projects disturbing one (1) to less than five (5) acres.
3. Projects disturbing less than one (1) acre (Smaller Sites).

B. Projects with Five (5) or More Acres Disturbed.

1. Obtain a copy of the TCEQ Construction General Permit (TPDES Permit No. TXR150000) and incorporate the permit provisions into the construction activities. Refer to the Appendix.
2. Develop and implement a storm water pollution prevention plan (SWP3). Refer to Appendix.
3. Complete and submit an NOI to the TCEQ (using the TCEQ form) to the address listed on the form prior to the commencement of the construction. Refer to appendix.
4. Submit a Notice of Termination (NOT) to the TCEQ (using the TCEQ form) once the site has reached final stabilization. Refer to Appendix.

C. Projects with One (1) to Less than Five (5) Acres Disturbed.

1. Obtain a copy of the TCEQ Construction General Permit (TPDES Permit No. TXR150000) and incorporate the permit requirements into the construction activities. Refer to Appendix.
2. Develop and implement a storm water pollution prevention plan (SWP3). Refer to Appendix.
3. Complete and post site notice (site notice is included in TXR150000). Refer to Appendix.
4. Before construction begins:

a. If site qualifies, complete and submit to the TCEQ a Low Rainfall Erosivity Waiver Form (East Texas sites typically do not qualify).

b. Complete and post a site notice (Site Notice form is included at the end of the TPDES Permit No. TXR150000).

5. For construction projects that will disturb one (1) or more acres, but less than five (5) acres, and are part of a larger common plan of development that will disturb five (5) or more acres, refer to Section 1.4.B "Projects with Five (5) or More Acres Disturbed".

D. Smaller Sites (Less than One Acre Disturbed)

1. For construction projects that disturb less than one acre and are not part of a larger common plan of development, coverage under the Construction General Permit is not required.

2. If the construction activity develops into a larger project, then permit coverage shall be required at the time based on the total number of acres disturbed.

1.5 STORM WATER POLLUTION PREVENTION PLAN

A. The requirements of the storm water pollution prevention plan include the following minimum provisions:

1. A detailed Project description, a map indicating the site location(s), a site map depicting construction site details, and information on the receiving waters must be included.

2. A description of the structural and the non-structural controls (best management practices, or BMPs) that will be used to minimize pollution in runoff during construction, as well as stabilization practices during and after the completion of the activity must be included.

3. A description of how BMPs will be maintained and how controls may be revised upon finding the control measures are either not working properly or adequately must be included.

4. A description of how site inspections will be conducted must be included. Inspections are required at a minimum frequency of at least once every 14 calendar days and within 24 hours of the end of a storm event of 0.5 inches or greater during active construction activities. Where sites have been temporarily stabilized, inspections must be conducted at least once every month. Special provisions allowing for representative inspections are provided for long, linear projects where access along the site is limited and travel along the site may damage stabilized areas or cause greater potential for erosion.

5. Identification and description of the implementation of appropriate pollution prevention measures for all eligible non-storm water components of the discharge.

1.6 ADDITIONAL REQUIREMENTS

A. The Developer/Contractor shall be solely responsible for insuring that erosion of the Project site(s) is kept to a minimum.

B. In areas of cut and fill as well as along ditch lines, the Developer/Contractor shall perform temporary grading as necessary to insure that water is not concentrated in one area in a manner which could cause significant erosion.

C. If necessary in the opinion of the City of Longview, the Developer/Contractor will be required to install erosion control berms, place hay bales, or construct siltation fences to prevent the loss of soil from the site and siltation of the pipes and channels downstream from the project due to construction.

D. In addition to the above-mentioned items, the Developer/Contractor shall also comply with any and all applicable State and Federal regulations relating to water quality and storm water runoff including but not limited to the EPA NPDES, and TCEQ TPDES Storm Water Regulations.

E. Any and all permits required for the Project under the above referenced regulations shall be obtained by the Developer/Contractor and all responsibilities related thereto shall be placed upon the Developer/Contractor and paid for as a part of this Contract as listed in the Bid Proposal.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02110 - PREPARING RIGHT-OF-WAY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Removal of surface debris.

B. Removal of trees, shrubs, and other plant life as noted on plans only.

C. Preparing Right-of-Way shall be performed meeting the requirements of TxDOT Item 100 unless otherwise specified within this section.

D. Removing Concrete and Brick Pavement shall be performed meeting the requirements of TxDOT Item 104 unless otherwise specified within this section.

E. Removing Stabilized Base and/or Asphaltic Pavement shall be performed meeting the requirements of TxDOT Item 105 unless otherwise specified within this section

F. Sawcutting of existing pavement and curbs and gutters will be required at the limits of construction.

1.2 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges, 2014 Edition.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with TxDOT Item 100 – Preparing Right of Way. See Section 01200 for Measurement and Payment.

B. Perform Work in accordance with TxDOT Item 104 – Removing Concrete and Brick Pavement. Measurement and Payment for this item will be considered subsidiary to the Preparing Right of Way bid item regardless of the subgrade.

C. Perform Work in accordance with TxDOT Item 105 – Removing Stabilized Base and/or Asphaltic Pavement. Measurement and Payment for this item will be considered subsidiary to the Preparing Right of Way bid item.

1.4 REGULATORY REQUIREMENTS

A. Conform to applicable code for environmental requirements, disposal of debris, burning debris on site, and use of herbicides.

B. Coordinate clearing Work with utility companies.

C. Meet all requirements of TxDOT Items

D. Existing concrete pavement, curb, asphalt pavement, brick, or curb and gutter to be removed, whether in streets or drives, shall be sawed along neat lines where portions are to be left in place. Cost of sawing shall be considered subsidiary to various bid items, unless otherwise shown.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 GENERAL

A. The Developer/Contractor shall make every effort to protect all lawns, trees, plants, and shrubs encountered during construction outside of the construction easement.

  1. In all cases where questions arise, the Developer/Contractor shall request clarification from the City of Longview.

  2. Any trees or shrubs which are in close proximity to the work or which are removed and replaced by the Developer/Contractor and die within a two (2) year period, beginning at the date of final payment, shall be removed and replaced at the Developer/Contractor's expense.

B. All sign posts and similar private or public obstructions which interfere with the construction of this project will be removed and replaced by the Developer/Contractor at his own expense.

  1. Power poles and guys, which interfere with construction, shall be braced and, if necessary, relocated by the utility company.

  2. The Developer/Contractor shall be responsible for coordinating this work with the utility company but shall not be responsible for the cost of the franchise utility's work. All of the Developer/Contractor's Work associated with coordination, relocation, removal, renovation of utilities shall be included in the bid items in proposal not in any allowances.

C. The Developer/Contractor shall protect all property lines, monuments, and stakes encountered in his work. All monuments and stakes for later use that are disturbed or destroyed by the Developer/Contractor shall be replaced at his expense.

D. In case it is necessary to change or move the property of any owner of a public utility, such property shall not be moved or interfered with until ordered to do so by the City of Longview.

  1. The right is reserved to the owner of public utilities to enter upon the limits of the project for the purpose of making such changes or repairs to their property that may be made necessary by performance of this Contract.

  2. Any time the Developer/Contractor intends to expose, cross, or otherwise work in the area of existing utilities, the Developer/Contractor shall notify the utility Owner five (5) days in advance.

E. The locations of existing utilities indicated on the Plans have been determined from field surveys and available public records.

1. Probes for determination of location and elevation have been made only at locations specifically described on the Plans.

2. Exact locations and elevation of all utilities are not guaranteed and shall be determined in the field by the Developer/Contractor prior to construction.

3. It shall be the duty of the Developer/Contractor to ascertain whether any additional utilities other than those shown on the Plans may exist and to locate the same prior to construction.

4. The Developer/Contractor shall also become familiar with any proposed adjustments to be made by the utility owners and extend full cooperation.

5. Any cost resulting from the Developer/Contractor's damages to existing utilities shall be the sole responsibility of the Developer/Contractor.

F. The Developer/Contractor shall be responsible for the protection of all existing utilities or service lines crossed or exposed by his construction operations.

1. Where existing utilities or service lines are cut, broken or damaged, the Developer/Contractor shall replace or repair the utilities or service lines with the same type of original material and construction, or better, at his own cost and expense.

2. The Developer/Contractor shall notify all owners of existing utilities a minimum of five (5) days prior to the start of construction.

G. It is expected that utility relocations by SWEPCO, AT&T, Longview Kilgore Cable TV, and Network Communications will be ongoing during this Project. The City has no direct control over these operations and will be held harmless in the event that delays to the Developer/Contractor due to the utility relocations, if any, are incurred.

H. Abandoned water lines or other pipe lines that have been cut during construction shall be plugged before backfill operations are complete. Cost of plugging existing lines shall be considered subsidiary to various bid items.

I. The Developer/Contractor may encounter unanticipated cultural or archeological deposits during construction.

1. If archeological sites or historic structures are discovered after construction operations are begun, the Developer/Contractor shall immediately cease operations in that particular area and notify the Owner.

2. The Developer/Contractor shall take reasonable steps to protect and preserve the discoveries until they have been inspected by the Owner's Representative.

3. The Owner will promptly coordinate with the Texas Historical Commission and any other appropriate agencies to obtain any necessary approvals or permits to enable the work to continue.

4. The Developer/Contractor shall not resume work in the area of the discovery until authorized to do so by the Owner.

3.2 PREPARATION

A. Verify that existing plant life designated to remain is tagged or identified.

B. Identify an area for placing removed materials.

3.3 SAWCUT EXISTING PAVEMENT

A. Equipment:

1. There shall be few limitations on joint sawing equipment provided the equipment is approved by the City of Longview and is in proper working order.

2. Both wet sawing, with diamond impregnated blades, and dry sawing, with silicon carbide or Carborundum blades may be used.

3. In general, silicon carbide or Carborundum blades are suitable for producing a clean cut edge through the existing hot mix asphaltic concrete.

B. Construction Methods:

1. Developer/Contractor shall sawcut existing hot mix asphaltic concrete or reinforced concrete pavement as required on the Plans.

2. Minimum depth of cut shall be three (3) inches.

3. Pavement removal adjacent to the sawcut shall leave a clean and sharply defined pavement edge, thereby creating a smooth and straight paving joint at the existing pavement and the proposed pavement interface.

3.4 PROTECTION

A. Locate, identify, and protect utilities that remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

C. Protect benchmarks, survey control points, and existing structures from damage or displacement.

3.5 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove trees and shrubs within marked areas. Remove stumps, main root ball, root system to a depth of 36 inches below proposed grade and/or below subgrade in paved areas prior to fill placement.

C. Clear undergrowth and deadwood.

3.6 REMOVAL

A. Remove debris, rock, and extracted plant life from site.

B. Partially remove paving, and curbs as indicated. Neatly saw cut edges at right angle to surface.

3.7 TOPSOIL EXCAVATION

A. Excavate topsoil from areas to be further excavated, re-landscaped, or re-graded, without mixing with foreign materials.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on site to depth not exceeding 8 feet and protect from erosion.

D. Remove excess topsoil not intended for reuse, from site.

3.8 DISPOSAL

A. Legally dispose of all material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

B. All trees, stumps, brush or other debris removed from the job site as a preliminary to the construction of the Work or its appurtenances shall be removed from the property and properly disposed of in a satisfactory manner.

C. All excavated earth in excess of that required for backfilling shall be removed from the job site and disposed of in a satisfactory manner.

D. The Developer/Contractor shall review proposed waste sites for material to be wasted from this project.

1. Developer/Contractor shall determine if any waste sites are located in a “Base Floodplain” or “Floodway” as defined by the Federal Emergency Management Agency (FEMA).

2. If waste material from this project is placed in a “Base Floodplain” or “Floodway” as defined by FEMA, the Developer/Contractor shall be responsible for obtaining a permit from the City of Longview.

3. The Developer/Contractor shall obtain a Development Permit from the City of Longview Engineering Department for any waste sites located within the city limits.

4. The Developer/Contractor shall furnish the City of Longview a copy of the signed agreement with the property owner for each disposal site, which the Developer/Contractor intends to use for "waste" materials.

5. Conditions and restrictions, if any, will be clearly stated.

6. Compliance will be required and a release from the property owner must be obtained upon completion of the Project.

E. All costs associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

F. Burning of debris shall not be permitted.

G. The Developer/Contractor shall be responsible for acquiring written approval and permits.

END OF SECTION

SECTION 02205 - SOIL MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Subsoil materials.

B. Topsoil materials.

1.2 RELATED SECTIONS

A. Geotechnical Report: Bore hole locations and finding of subsurface materials.

B. Section 01400 – Quality Control: Testing soil fill materials.

C. Section 02207 – Aggregate Materials.

D. Section 02225 – Excavating, Backfilling, and Compacting for Utilities.

E. Section 02923 – Landscape Grading.

F. Section 02938 – Sodding.

1.3 REFERENCES

A. ASTM D698 – Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures.

B. ASTM D2487 – Classification of Soils for Engineering Purposes.

C. ASTM D2922 – Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

D. ASTM D3017 – Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. Association of Official Agriculture Chemists

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 – Submittals: Procedures for submittals.

B. Samples:

1. Submit, in air–tight containers, 10 lb. sample of each type of fill to testing laboratory.

2. All off-site materials must be approved by the City of Longview prior to installation.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01300 – Submittals: Procedures for submittals.

B. Materials Source: Submit name of imported materials source.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Plans and Specification requirements, TxDOT standards, and City of Longview standards.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Soil Type S1 – Subgrade material:

1. Material remaining in place after excavation.

2. Suitable for slab/foundation subgrade, undisturbed nor over excavated.

3. Where subgrade soils are soft, loose, or otherwise unsatisfactory, the soil shall be removed and replaced with select fill or soil cement as determined by the City of Longview.

B. Soil Type S2 – Common Fill:

1. Excavated and re-used material or from borrow approved by the City of Longview.

2. Graded free of lumps larger than 3 inches, rocks larger than 2 inches, excessive silts and debris.

3. Do not use soil containing brush, roots, or similar organic matter.

4. Conforming to ASTM D2487 Class II or Class III soils with a liquid limit less than 40, and a plasticity index less than 20, but greater than 4.

C. Soil Type S3 – Select Fill:

1. Imported borrow material from borrow area approved by the City of Longview. Material shall be tested for compliance by the Developer/Contractor and test results submitted to the City of Longview for approval.

2. Clayey sand soils free from organic matter with no lumps larger than 1 inch, no rocks larger than ½ inch, nor excessive silts.

3. Do not use soils containing brush, roots, sod or other organic materials.

4. Select fill shall conform to ASTM D2487 Class II or Class III and shall have a liquid limit less than 30 with a plasticity index less than 15 but greater than 4.

D. Soil Type S4 – Top Soil:

1. Soil suitable for growth of surface cover. Material stripped and stockpiled from site or borrowed from off site.

2. Free from roots, brush, rocks, and other extraneous matter exceeding 1 inch in any direction. Free from weeds

3. Minimum 60% sand, Maximum 30% silts, Maximum 10% clay, no less than 6% and no more than 20% organic matter.

4. Submit test data showing compliance with these specifications. Include percent weight of constituent material, material particle size, and pH.

    a. Topsoil shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches or more in diameter), clay lumps or similar objects.

    b. There shall be not less than twenty percent (20%) nor more than eighty percent (80%) of the material passing the 200-mesh sieve as determined by the wash test in accordance with ASTM C 117.

    c. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the Association of Official Agriculture Chemists in effect on the date of the invitation of bids.

    d. The organic content shall be not less than three percent (3%) nor more than twenty percent (20%) as determined by the wet-combustion method (chromic acid reduction).

2.2 SOURCE QUALITY CONTROL

A. Section 01400 – Quality Control: Testing and analysis of soil material.

B. Testing and Analysis of Subsoil Material: Perform in accordance with ASTM D698.

C. Testing and Analysis of Topsoil Material: Perform in accordance with ASTM D698.

D. If tests indicate materials do not meet specified requirements, change material and retest.

E. Provide materials of each type from same source throughout the Work. A change in source requires sampling, testing, and approval by the City of Longview.

PART 3 EXECUTION

3.1 SOIL REMOVAL

A. Excavate soils from areas designated.

B. Remove lumped soil, boulders, and rock.

C. Stockpile excavated material in area designated on site and remove excess material not being used, from site.

3.2 STOCKPILING

A. Stockpile materials on site at locations designated by City of Longview.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Prevent intermixing of soil types or contamination.

E. Direct surface water away from stockpile site to prevent erosion or deterioration of materials.

3.3 STOCKPILE CLEANUP

A. Remove stockpile, leave area in a clean and neat condition

B. If a borrow area is indicated, leave area in a clean and neat condition.

C. Grade site surface to prevent free standing surface water.

END OF SECTION

SECTION 02207 - AGGREGATE MATERIALS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aggregate materials.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control: Testing aggregate fill materials.

B. Section 02205 - Soil Materials.

C. Section 02224 - Excavation, Backfilling and Compaction for Structures.

D. Section 02225 - Excavation, Backfilling, and Compacting for Utilities.

E. Section 02227 - Excavation, Embankment and Compaction for Roadways and Channels.

F. Section 02228 - Foundation Material for Unsuitable Subgrade.

G. Section 02923 – Landscaping Grading.

1.3 REFERENCES

A. ASTM C29 - Unit Weight of Aggregate

B. ASTM C88 - Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

C. ASTM C117 - Materials Finer than 75um (No. 200) Sieve in Mineral Aggregates by Washing

D. ASTM C131 - Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine

E. ASTM C136 - Method for Sieve Analysis of Fine and Coarse Aggregates.

F. ASTM D75 - Sampling Aggregate

G. ASTM D693 - Crushed Stone, Crushed Slag, and Crushed Gravel for Dry-or Water-Bound Macadam Base Courses and Bituminous Macadam Base and Surface Courses of Pavements

H. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures.

I. ASTM D2419 - Sand Equivalent Value of Soils and Fine Aggregate

J. ASTM D2487 - Classification of Soils for Engineering Purposes.

K. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

L. ASTM D3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

M. ASTM D3665 - Random Sampling of Paving Materials

N. ASTM D4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

O. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Samples: Submit, in air-tight containers, 10 lb. sample of each type of material to testing laboratory.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.

B. Materials Source: Submit name of imported materials suppliers.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with Plans and Specification requirements, TxDOT standards, and City of Longview standards.

PART 2 PRODUCTS

2.1 COARSE AGGREGATE MATERIALS

A. Coarse Aggregate Type A1 - Drain Rock:

1. As shown on the Plans, under structures and behind walls shall be clean, washed, sound durable, well-graded crushed rock, crushed gravel, or natural stone gravel.

2. Conforming to ASTM C-33 Size No. 3 coarse aggregate between 1 inch and 2 inch.

B. Coarse Aggregate Type A2 - Pipe Embedment:

1. Angular ¾ inch to 1 inch crushed rock or natural stone meeting the requirements of ASTM C-33 No. 57.

2. Embedment material shall be clean, washed, sound, durable and well graded.

C. Coarse Aggregate Type A3 - Foundation Material:

1. Coarse stone or crushed gravel.

2. Foundation material shall be pit run angular crushed, natural washed stone free of shale, clay, friable material and debris; well graded between 1 and 3 inches in size, with a minimum of 90% retained on a 1-inch sieve.

D. Coarse Aggregate Type A3-1 - Foundation Material for Unsuitable Pavement Subgrade:

1. Foundation material shall conform to the specification for TxDOT Item 247, Type "A", Grade 2.

E. Aggregate Type A4 - Pea Gravel:

1. Natural stone; washed, free of clay, shale, organic matter; graded in accordance with ASTM C136 to the following limits:

   a. Minimum Size: 1/4 inch

   b. Maximum Size: 5/8 inch

F. Aggregate Type A5 – Type "R" Modified Rock Riprap:

1. Natural stone, washed free of clay and shale, and shall meet all of the requirements of TxDOT Item 432, for Type R Stone Riprap with the following modifications:

   a. Stones shall weigh between 50 to 150 pounds with no less than 50 percent of the stones shall weigh more than 100 pounds.

   b. Rock's longest dimension shall not exceed 3 times that of the shortest dimension.

   c. Delete paragraphs 432.5 Measurement and 432.6 Payment, and refer to Section 01200 – Unit Bid Prices of these Specifications.

2.2 FINE AGGREGATE MATERIALS

A. Fine Aggregate Type A5 - Sand:

1. Natural river or bank sand; washed, free of silt, clay, loam, friable or soluble materials and organic matter; graded in accordance with ASTM C136; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 14	10 to 100
No. 50	5 to 90
No. 100	4 to 30
No. 200	0 to 10

2.3 SOURCE QUALITY CONTROL

A. Section 01400 - Quality Control: Source testing and analysis of aggregate material.

B. Coarse Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, and ASTM C33.

C. Fine Aggregate Material - Testing and Analysis: Perform in accordance with ASTM D698, and ASTM C33.

D. If tests indicate materials do not meet specified requirements, change material or material source and retest.

E. Provide materials of each type from same source throughout the Work. A change in source requires sampling, testing, and approval by the City of Longview.

PART 3 EXECUTION

3.1 STOCKPILING

A. Stockpile materials on site at locations designated by the City of Longview.

B. Stockpile in sufficient quantities to meet Project schedule and requirements.

C. Separate differing materials with dividers or stockpile apart to prevent mixing.

D. Direct surface water away from stockpile site so as to prevent erosion or deterioration of materials.

3.2 STOCKPILE CLEANUP

A. Remove stockpile; leave area in a clean and neat condition. Grade site surface to prevent freestanding surface water.

B. Leave unused materials in a neat, compact stockpile.

C. If a borrow area is indicated, leave area in a clean and neat condition.

D. Grade site surface to prevent freestanding surface water.

END OF SECTION

SECTION 02220 - TRENCH AND EXCAVATION SAFETY SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Requirements for a Trench and Excavation Safety System to be designed and furnished by the Developer/Contractor for the safety and health of personnel.

B. Submission of a written Plan describing the System in detail.

1.2 REFERENCES

A. 29CFR1926 - Occupational Safety and Health Standards - Excavations, United States Department of Labor, latest edition.

B. Others - Other applicable Federal, State, and local rules for Trench Construction or excavations.

1.3 REQUIREMENTS

A. The Developer/Contractor shall develop, design, and implement a System.

B. The Developer/Contractor shall bear the sole responsibility for the adequacy of the System.

C. The requirements of 29CFR1926 shall be the minimum requirements for this Specification and are adopted as a part of this Specification.

D. Other regulations relating to Trench and Excavation Safety shall also be considered a part of this Specification as if referenced directly.

E. Should the System require wider trenches than shown, the Developer/Contractor shall be responsible for the costs associated with determining adequacy of pipe bedding and class, as well as, purchase and installation of alternate materials.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 GENERAL

A. Implement the system in accordance with the written System Plan and conduct affected work in accordance with the same.

B. The system shall be in use during all phases of construction.

C. The City of Longview is not responsible for ensuring the Trench and Evacuation Safety System is constructed and utilized in accordance with the Safety Plan.

D. This shall be the sole responsibility of the Developer/Contractor.

3.2 EXISTING STRUCTURES

A. Where existing buildings, other utilities, streets, highways, or other structures are in close proximity to the trench, adequate protection shall be provided by the use of sheeting and shoring to protect the structure, street, or highway from possible damage.

B. In the case of utilities, the Developer/Contractor may elect to remove the utility provided that the removal and subsequent replacement meets with the approval of the City of Longview, the utility owner, or whoever has jurisdiction of the structure.

C. In all cases, it shall be the responsibility of the Developer/Contractor to protect public and private property and any person or persons who might, as a result of the Developer/Contractor's work, be injured.

3.3 EXCAVATIONS, TRENCHING, AND SHORING: The Developer/Contractor shall include in his bid price and be solely responsible for trench safety provisions meeting the requirements of the Unites States Department of Labor Occupational Safety and Health Administration, as contained in Subpart P, Part 126 of the Code of Federal Regulations along with all other applicable subparts and regulations not contained therein.

END OF SECTION

SECTION 02224 - EXCAVATION, BACKFILLING, AND COMPACTING FOR STRUCTURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavation shall include the removal of all earth, rock, or other materials to the extent necessary to install structures or storm sewer pipe, pre-cast reinforced concrete box culverts, and appurtenances in conformance with the lines and grades shown in the Plans or as specified.

B. Backfilling and compacting shall included all backfilling, embankment, and compaction necessary to install structures or storm sewer pipe, pre-cast reinforced concrete box culverts, and appurtenances in conformance with the lines and grades shown in the Plans or as specified.

1.2 RELATED SECTIONS

A. Section 02205 – Soil Materials

B. Section 02207 – Aggregate Materials

C. Section 02220 – Trench and Excavation Safety System

1.3 REFERENCES

A. ASTM C33 - Coarse Aggregates.

B. ASTM D698 - Standard Methods of Test for Moisture-Density Relations of Soil (Standard).

C. ASTM D1557 - Test for Moisture-Density Relations of Soil (Modified).

D. ASTM D2487 - Classification of Soils for Engineering Purposes.

E. ASTM D2922 - Density of Soil and Soil Aggregate In-Place by Nuclear Methods.

F. ASTM D3017 - Moisture Content of Soil and Soil Aggregate In-Place by Nuclear Methods.

G. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

H. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

I. OSHA - Occupational Safety and Health Administration and Related Regulations.

1.4 SUBMITTALS

A. Procedures for Submittals: Section 01300.

B. Samples: Aggregate samples of material as required by the testing laboratory.

C. Quality Control Submittals: For information only.

1.5 PROTECTION OR REMOVAL OF UTILITY LINES

A. The Developer/Contractor shall anticipate all underground and above ground obstructions such as, but not limited to, water mains, gas lines, storm and sanitary sewers, telephone or electric light or power ducts, concrete, and debris.

1. It shall be the responsibility of the Developer/Contractor to verify the existence and location of all underground and above ground utilities along the route of the work.

2. Any such lines or obstructions indicated on the Plans show only the approximate locations and shall be verified in the field by the Developer/Contractor.

3. The City of Longview will endeavor to familiarize the Developer/Contractor with all known utilities and obstructions, but this shall not relieve the Developer/Contractor from full responsibility in anticipating all underground and above ground obstructions whether or not shown on the Plans.

4. The omission from or the inclusion of utility locations on the Plans is not to be considered as the non-existence of, or a definite location of existing utilities.

B. The Developer/Contractor shall, at his own expense, maintain in proper working order and without interruption of service all existing utilities and services which may be encountered in the work.

1. With the consent of the City of Longview and utility owner such service connections may be temporarily interrupted to permit the Developer/Contractor to remove designated lines or to make temporary changes in the locations of services.

2. The cost of making any temporary changes shall be at the Developer/Contractor's expense.

C. The Developer/Contractor will take the necessary precautions to protect existing utilities from damage due to his operations.

D. Any damage to the utilities will be repaired at the Developer/Contractor's expense.

E. Notify all utility companies involved to have their utilities located and marked in the field.

1. All underground utilities shall then be uncovered to verify location and elevation before construction begins.

2. The Developer/Contractor shall obtain all necessary permits.

F. The Developer/Contractor shall obtain necessary permits, except right-of-way permits, required for completion of the project.

G. Utility Spacing: The spacing for utility lines shall meet the installation requirements and the requirements of the TCEQ 30TAC 290.44(e).

1.6 PROJECT CONDITIONS

A. Maximum and Minimum Width of Excavation:

1. Unless otherwise specified on the plans, the minimum width of trench in which the pipe may be installed shall be 12 inches plus the outside diameter of the pipe or the structure.

2. The maximum width shall be 24 inches plus the outside diameter of the pipe or the structure.

3. Whenever the prescribed maximum trench width is exceeded, except as such excess may be necessary for compliance with the plans or specifications, the pipe may be cradled with 2,500 psi Concrete as directed by the City of Longview, and at the expense of the Developer/Contractor.

B. Protection:

1. Erect sheeting, shoring, and bracing as necessary for protection of persons, improvements, existing structures, and excavations.

2. See Section 02220 for requirements for sheeting, shoring, and bracing for trench and excavation safety.

C. Dewatering of Trenches and Excavations

1. This section covers the dewatering of trenches to the extent that bedding material and pipe can be placed on dry, firm trench bottom.

2. Provide dewatering and drainage necessary to keep excavations free of water.

   a. Dewatering System shall maintain the water level a minimum of 3 feet below the excavation.

   b. Developer/Contractor shall provide and maintain all dewatering equipment during excavation, construction, backfill, and until structure is placed in service.

   c. Developer/Contractor shall operate dewatering system continuously without interruption during weekends and/or holidays.

3. Dewatering of trenches other than by wellpointing shall be accomplished by whatever means elected by the Developer/Contractor; however, bedding material or pipe may not be placed in wet or unstable trenches.

4. Soil that cannot be properly dewatered shall be excavated and Coarse Aggregate Type A3-1 material placed to such a depth as may be required to provide a firm trench bottom.

5. Surface Runoff:

   a. Surface runoff water shall be diverted away from the trenches.

   b. Such diversion shall be into existing drainage structures, such as storm sewers, ditches, or streams.

   c. Diversion of surface runoff shall be in such a manner to prevent flooding of streets or private property.

6. Disposition of Water from Dewatering:

   a. All water removed from the trenches by wellpointing or any other means shall be pumped, piped, or drained into existing drainage structures, such as storm sewers, ditches, or streams.

   b. The disposition of water from dewatering operations shall be accomplished in a manner that will prevent the flooding of public or private property.

   c. Provisions shall be made for the satisfactory disposal of surface water pumped so as to prevent damage to public or private property.

D. Coordination: Coordinate backfill operations with installation of utilities.

PART 2 PRODUCTS

2.1 MATERIALS

A. General Site Fill: Section 02205.2.1.B – Soil Type S2 – Common Fill

B. Earth Backfill: Section 02205.2.1.C – Soil Type S3 – Select Fill

C. Topsoil: Section 02205.2.1.D – Soil Type S4 – Top Soil

D. Aggregate: Section 02207.2.1.B – Coarse Aggregate Type A2 – Pipe Embedment

E. Crushed Rock: Section 02207.2.1.D – Coarse Aggregate Type A3 – Foundation Material

F. Sand: Section 02207.2.2.A – Fine Aggregate Type A5 - Sand

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine project site and investigate existing subsurface conditions to determine nature, kind and character of materials and conditions to be encountered.

B. Prior to commencing excavation operations, disconnect and cap or protect existing utility services, if any, in accordance with the requirements of the owning companies and applicable ordinances and regulations.

C. Provide for surface drainage.

D. Keep excavations free of water during entire progress of the work.

E. Prior to backfilling grade beams and below grade walls, verify that beams, walls and footing have properly cured.

F. Verify that forms, trash, debris and applicable temporary shoring have been removed.

G. Verify that walls are supported at top and bottom.

3.2 EXCAVATION AND SUBGRADE PREPARATION – STRUCTURES

A. Excavate beneath structures to lines, grades, and elevations as shown.

   1. Over excavation shall be restored by the Developer/Contractor at his own expense.

   2. Over excavation shall be corrected by backfilling with select fill in 8-inch lifts.

   3. Compact to 95% of maximum density within 2% of optimum moisture per ASTM D698.

B. Scarify exposed surfaces to a depth of 8 inches and recompact to a density of 95 percent of the maximum density when tested by the Standard Proctor Compaction Test (ASTM D698), at a moisture content of ±2 percent of optimum.

C. Remove weak or highly organic soils noted by probing and replace with select site fill. Place fill in 8-inch lifts and compact to 95 percent of maximum density (ASTM D698) at a moisture content of ±2 percent of optimum.

D. Do not extend structure fill beyond structure lines or as shown.

E. All excavation is unclassified.

   1. Break rock with hydraulic ram to obtain near neat line excavation.

   2. Blasting is not allowed.

3.3 BACKFILL – STRUCTURES

A. Schedule backfilling to expedite construction progress.

B. Backfill in manner to prevent excessive pressure against previously completed work and to prevent damage or displacement to utility systems.

C. Place backfill materials for grade beams as follows:

1. Exterior Face of Grade Beams: Where required, backfill with select fill Place backfill in layers of approximately eight (8) inches loose lifts and compact to 98 percent of maximum density at ±2 percent of optimum moisture content. Standard Proctor Density (ASTM D698).

2. Place backfill at grade beams as soon as forms are removed.

   a. Keep grade beam excavations dry at all times.

   b. If rain occurs before backfill is placed, remove water from excavations immediately.

D. Backfill structure walls with select fill.

1. Compact by vibrating to 95 percent of maximum density within two percent of optimum moisture as measured by ASTM D698.

2. Do not over compact. Place backfill in 8-inch lifts.

E. Exercise care to prevent over compaction of backfills.

F. Where top of below grade structure backfill is not covered with paving or other impervious barrier, the final 2 feet of backfill shall be select fill.

1. Place fill in 8 inch thick lifts and compact to 95 percent of maximum density at ±2 percent of optimum moisture content.

2. Allow for 4 inches of topsoil placement.

3.4 MATERIAL DISPOSAL

A. Suitable excavated materials shall be piled adjacent to the work to be used for backfilling.

B. Excavated materials unsuitable for the backfilling, or in excess of that required for backfilling shall be disposed of by the Developer/Contractor at locations designated on the plans or approved by the City of Longview.

C. Desirable topsoil, sod, etc. shall be carefully piled separately in its original position when required.

D. Excavated materials shall be handled at all times in such a manner as to cause a minimum inconvenience to public travel and to permit safe and convenient access to private and public property adjacent to or along the line of the work.

E. In parkways and easements where it is necessary to deposit excavated materials on lawns during the work, burlap or similar materials shall be placed on the lawn to prevent contact between excavated materials and the lawn.

F. Remove waste and excess excavated material from the construction site before final inspection.

G. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

H. All costs associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02225 - EXCAVATION, BACKFILLING, AND COMPACTING FOR UTILITIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating, trenching, backfilling and compacting for water distribution lines, sanitary sewer collection lines, reinforced concrete storm sewer pipe, and other utility systems and appurtenances, and the disposal of excess excavated material.

1.2 REFERENCES

A. ASTM C33 - Coarse Aggregates.

B. ASTM D698 - Moisture-Density Relations of Soils (Standard.)

C. ASTM D2487 - Classification of Soils for Engineering Purposes.

D. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

E. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

F. OSHA - Occupational Safety and Health Administration and Related Regulations.

1.3 PROTECTION OR REMOVAL OF UTILITY LINES

A. The Developer/Contractor shall anticipate all underground and above ground obstructions such as, but not limited to, water mains, gas lines, storm and sanitary sewers, telephone or electric light or power ducts, concrete, and debris.

B. Any such lines or obstructions indicated on the Plans show only the approximate locations and shall be verified in the field by the Developer/Contractor. Any adjustment to the proposed utility to avoid conflicts with obstructions, whether shown on the Plans or not, shall be subsidiary to the unit price for the proposed utility unless shown otherwise in the bid proposal.

C. The City of Longview will endeavor to familiarize the Developer/Contractor with all known utilities and obstructions, but this shall not relieve the Developer/Contractor from full responsibility in anticipating all underground and above ground obstructions whether or not shown on the Plans.

D. The Developer/Contractor shall, at his own expense, maintain in proper working order and without interruption of service all existing utilities and services which may be encountered in the work.

E. With the consent of the City of Longview and utility owner such service connections may be temporarily interrupted to permit the Developer/Contractor to remove designated lines or to make temporary changes in the locations of services.

F. The cost of making any temporary changes shall be at the Developer/Contractor's expense.

G. Notify all utility companies involved to have their utilities located and marked in the field. All underground utilities shall then be uncovered to verify location and elevation before construction begins.

H. The Developer/Contractor shall obtain necessary permits required for completion of the project.

1.4 PROJECT CONDITIONS

A. Excavations:

1. All excavations are unclassified.

B. Protection:

1. Erect sheeting, shoring, and/or bracing as necessary for protection of persons, structures, property corners, excavations, or other improvements. The cost for sheeting, shoring, and/or bracing shall be considered subsidiary to the cost for the utility to be constructed. No additional payment will be made for sheeting, shoring, and/or bracing as required for construction of proposed utilities.

2. Provide dewatering and drainage necessary to keep excavations free of water. Dewatering System shall maintain the water level a minimum of 3 feet below the excavation. Developer/Contractor shall provide and maintain all dewatering equipment during excavation, construction, backfill, and until utility is placed in service. Developer/Contractor shall operate dewatering system continuously without interruption during weekends and/or holidays.

PART 2 PRODUCTS

2.1 MATERIALS

A. Backfill: Backfill shall be excavated and reused or borrow material free of lumps larger than 1 inch, stones larger than 1/2 inch, trash, organic, spongy or otherwise objectionable material. Backfill materials shall be approved by City of Longview. Refer to section 02207, 02205, and the Plans.

B. Sand: Sand shall be free from clay lumps, organic and other deleterious material, and have a plasticity index no greater than 12, as determined by ASTM D4318.

C. Crushed Rock: Provide durable crushed rock free of clay lumps, organic or other deleterious material. Crushed rock size shall be Class I per ASTM D1487. ASTM C33, size No. 57 or 67 shall be considered Class I material.

D. Coarse-Grained Soils: Coarse-grained soils for pipe bedding shall be ASTM D2487, Class II or III. See Section 02207, Type A2 for pipe bedding.

E. Aggregate Materials: Aggregate materials shall conform to the requirements of Section 02207 of these specifications.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine utility routes and coordinate excavation work to eliminate installation conflicts.

B. Allow room for stockpiling excavated material and utility construction material during utility construction.

3.2 TRENCH EXCAVATION

A. Procedure: Excavate to indicated or specified depths and widths.

1. Excavate by open cut method, all excavations are unclassified.
2. Dispose of unacceptable backfill material and provide suitable material for backfill without additional expense.
3. During excavation, stockpile material suitable for backfilling in an orderly manner far enough from the bank of the trench to avoid overloading, slides, or cave-ins.
4. Grade as necessary to prevent surface water from flowing into trenches or other excavations.
5. Cut banks of trench as nearly vertical as practical. Remove stones as necessary to avoid point-bearing. Over-excavate wet or unstable soil from the trench bottom to permit construction of a more stable bed for pipe. Over excavation shall be filled and tamped with clean dry sand or other materials approved by the City of Longview to the required grade. Obtain approval from the City of Longview Representative prior to over excavation.

6. Excavate the trench the proper width as shown. If the trench width below the top of pipe is wider than specified in this Section or shown, install additional backfill. No additional payment will be made for additional material or work required for installation.

7. Accurately grade the trench bottom to provide proper bedding as required for pipe installation.

8. If any excavation is carried beyond the lines and grades required or authorized, the Developer/Contractor shall, at his own expense, fill such space with concrete or other suitable material as directed by the City of Longview. No additional payment will be made.

9. Construct trench in accordance with Developer/Contractor's Trench Safety Plan.

B. Sheeting and Bracing: Install sheeting and bracing necessary to support the sides of trenches and other excavations with vertical sides, as required by current OSHA regulations.

C. Water In Excavation: Keep work free from ground or surface water at all times. Provide pumps of adequate capacity or other approved method to remove water from the excavation in such a manner that it will not interfere with the progress of the work or the proper placing of other work.

D. Trenching Progress: Trenching operations shall not be in excess of 100 feet ahead of pipe laying operations in City streets or 2,000 feet in open country. Not more than two (2) consecutive cross-streets may be closed to traffic at any given time. Trench across only those streets identified to be open cut on the Plans.

E. Existing Lawns and Shrubbery: The Developer/Contractor shall take particular care to preserve existing lawns and shrubbery. Make minor pipe alignment changes as may be necessary with the approval of the City of Longview.

F. Existing Pavement: Existing pavement over trenches shall be removed to a width of 6 inches outside of the trench on each side. Remove to a neat line by sawing method perpendicular to the pavement.

3.3 PIPE BEDDING

A. Pipe Zone: The pipe zone is defined as including the pipe bedding, backfill with crushed aggregate to 50% of the pipe diameter and the initial backfill to 12 inches above the top of the pipe.

B. Class A Bedding:

1. Where shown, the Developer/Contractor shall install the pipe in concrete encasement.

2. Concrete for encasement shall be 3000 psi compressive strength as specified in Section 03300.

3. Precautions shall be used to prevent pipe movement or deflection during construction.

4. Concrete for encasement, shall be included in the unit price bid per linear foot in place.

C. Class B Bedding:

1. Accurately grade the bottom of the trench 4 inches below the bottom of the pipe and limits of clear space on either side of the pipe.

2. Place a minimum of 4 inches of compacted sand backfill up to the flow line of the pipe or above before pipe is laid. Install pipe, place additional sand backfill to springline and compact.

3. Complete bedding with compacted sand to 6 inches above the top of the pipe.

4. Compact the bedding and backfill to a minimum of 95 percent of maximum dry density per ASTM D698, maintaining moisture within ± 2 percent of optimum or 70 percent of relative density per ASTM D-4254.

D. Class C Bedding:

1. All pipe bedding shall be Class C, unless otherwise approved by the City of Longview.

2. Accurately grade the bottom of the trench 4 inches below the bottom of the pipe and to the limits of the clear space on either side of the pipe.

3. Place a minimum of 4 inches of compacted granular embedment material (Type A2) below the pipe and to 50% of the pipe diameter.

4. The initial layer of embedment material placed to receive the pipe shall be brought up to a grade slightly higher than that required for the bottom of the pipe and the pipe shall be placed thereon and brought to grade by tamping, or by removal of the slight excess amount of embedment under the pipe.

5. Adjustment to grade line shall be made by scraping away or filling with embedment materials. Wedging or blocking up of pipe will not be permitted.

6. Each pipe section shall have a uniform bearing on the embedment for the full length of the pipe, except immediately at the joint.

7. After each pipe has been graded, aligned, placed in final position on the bedding material and joint made, sufficient embedment material shall be deposited and compacted under and around each side of the pipe and back of the bell or end thereof to hold the pipe in proper position and alignment during subsequent pipe jointing and embedment operations.

8. Embedment material shall be deposited simultaneously on each side of pipe and compacted uniformly to the spring line or the elevation shown on the plans, whichever is higher.

9. Sheeting and shoring will not be allowed in the pipe zone during or after installation of the pipe or embedment material, unless special provisions are made to ensure the specified compaction of bedding and pipe alignment is maintained after removal of sheeting and shoring.

E. Class D Bedding:

1. Accurately grade the bottom of the trench 4 inches below the bottom of the pipe and to limits of clear space on either side of the pipe.

2. Place and compact a minimum of 4 inches of earthen backfill up to the flow line of the pipe or above before pipe is laid.

3. Install the pipe and place additional earthen backfill to the springline of the pipe and compact.

4. Complete bedding with compacted earthen backfill to 12 inches above the top of the pipe.

5. Compact the bedding and backfill to minimum of 95 percent of maximum density per ASTM D698. Maintain moisture within ±2 percent of optimum.

3.4 UTILITY INSTALLATION

A. Utility Lines: Provide a minimum cover over the top of the pipe as indicated. Avoid interference with other utilities. Provide class of bedding as shown. Install piping and appurtenances as specified.

B. Excavation for Appurtenances: Excavate sufficiently for valves, valve boxes, manholes, junction boxes, and similar structures to leave at least 2 feet clear distance between the outer surfaces and the embankment or timber that may be used to hold and protect the banks.

C. Over excavation: Any over-depth excavation below appurtenances not directed will be considered unauthorized and will be refilled with concrete or approved foundation material, as directed by the City of Longview. Over excavation shall include over-depth and over-width excavation.

3.5 BACKFILLING

A. Criteria: Backfill trenches to ground surface with material as specified. Reopen trenches improperly backfilled to depth required for proper compaction. Refill and compact as specified, or otherwise correct the condition in a manner approved by the City of Longview.

B. Open Areas:

1. Above the pipe zone, Common Fill meeting the requirement of Soil Type S2 in 6 inch lifts. Mound excess material over trench to allow for settlement.

2. All forms, lumber, trash and debris shall be removed from trenches, manholes and other utility structures. Backfill for valves, valve boxes, and other utility structures shall be placed in accordance with applicable specification sections and the drawings.

C. Pavement Section:

1. Above pipe zone, Select Fill meeting the requirement of Soil Type S3 in 6 inch lifts.

2. Compact to 95% of maximum density within 2% of optimum moisture per ASTM D698.

3. Complete the backfill with aggregate base course and asphalt paving as specified and detailed.

3.6 DISPOSAL OF EXCESS MATERIAL

A. Remove waste and excess excavated material from the construction site before final inspection. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site. All costs associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02227 - EXCAVATION, EMBANKMENT AND COMPACTING FOR ROADWAYS AND CHANNELS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Excavating, embankment and compaction of roadways, channels and/or special excavation of the required material in the areas shown on the Plans and cross sections to the lines, grades and typical sections as specified, and the disposal of excess excavated material.

B. Excavation shall be performed meeting the requirements of TxDOT Item 110 unless otherwise specified within this section.

C. Embankment shall be performed meeting the requirements of TxDOT Item 132 unless otherwise specified within this section.

D. Sprinkling shall be performed meeting the requirements of TxDOT Item 204 unless otherwise specified within this section.

E. Rolling (Tamping, Pneumatic Tire, Heavy Pneumatic Tire and Vibratory) shall be performed meeting the requirements of TxDOT Items 211, 213, 214, and 217 respectively unless otherwise specified within this section.

F. Rolling (Proof) shall be performed meeting the requirements of TxDOT Items 216 unless otherwise specified within this section.

1.2 RELATED SECTIONS

A. Section 02205 – Soil Materials

B. Section 02207 – Aggregate Materials

1.3 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition.

B. ASTM C33 - Coarse Aggregates.

C. ASTM D698 - Moisture-Density Relations of Soils (Standard.)

D. ASTM D2487 - Classification of Soils for Engineering Purposes.

E. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

F. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.4 REGULATORY REQUIREMENTS

A. Perform Work in accordance with TxDOT Item 110 – Excavation. See Section 01200 for Measurement and Payment.

B. Perform Work in accordance with TxDOT Item 132 – Embankment. See Section 01200 for Measurement and Payment.

C. Perform Work in accordance with TxDOT Item 204 – Sprinkling. For this project, sprinkling shall not be measured or paid separately but shall be considered subsidiary to the various bid items.

D. Perform Work in accordance with TxDOT Items 211, 213, 214, and 217 – Rolling (Tamping, Pneumatic Tire, Heavy Pneumatic Tire, and Vibratory) respectively. For this project, tamping, pneumatic tire, heavy pneumatic tire, and vibratory rolling shall not be measured or paid separately but shall be considered subsidiary to the various bid items.

E. Perform Work in accordance with TxDOT Item 216 – Rolling (Proof). See Section 01200 for Measurement and Payment.

PART 2 PRODUCTS

2.1 MATERIALS

A. Embankment

1. Embankment provided to establish subgrade lines and grade shall be Type A material per TxDOT Standard Specification Item 132, except for the following:
    a. The plasticity index shall not be less than 5 nor greater than 15.
    b. The liquid limit shall not exceed 35.
2. Each layer shall be sprinkled as required and compacted to the extent necessary to provide the density specified of 95% of standard proctor density per ASTM D-698.
3. All Roadway and Channel Embankment shall be Density Control as called for in TxDOT Item 132.3.(3).(b)

B. Sand: Section 02207.2.2.A – Fine Aggregate Type A5 - Sand

C. Crushed Rock: Section 02207.2.1.D – Coarse Aggregate Type A3-1 – Foundation Material for Unsuitable Subgrade

D. Coarse-Grained Soils: Section 02205.2.1.B – Soil Type S2 – Common Fill

PART 3 EXECUTION

3.1 DISPOSAL OF EXCESS MATERIAL

A. Excavated materials unsuitable for the backfilling, or in excess of that required for backfilling shall be disposed of by the Developer/Contractor at eligible locations.

B. Desirable topsoil, sod, etc. shall be carefully piled separately in its original position when required.

C. Excavated materials shall be handled at all times in such a manner as to cause a minimum inconvenience to public travel and to permit safe and convenient access to private and public property adjacent to or along the line of the Work.

D. In parkways and easements where it is necessary to deposit excavated materials on lawns during the Work, burlap or similar materials shall be placed on the lawn to prevent contact between excavated materials and the lawn.

E. Suitable excavated materials shall be piled adjacent to the Work to be used for backfilling.

F. Remove waste and excess excavated material from the construction site before final inspection.

G. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

H. All cost associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02228 - FOUNDATION MATERIAL FOR UNSUITABLE SUBGRADE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This item shall govern for the removal of subgrade material deemed unsuitable or deficient as a result of proof rolling and the subsequent replacement and compaction of approved subgrade material.

1.2 RELATED SECTIONS

A. Section 02207 – Aggregate Materials

1.3 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition.

B. ASTM C33 - Coarse Aggregates.

C. ASTM D698 - Moisture-Density Relations of Soils (Standard.)

D. ASTM D2487 - Classification of Soils for Engineering Purposes.

E. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

F. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

PART 2 PRODUCTS

2.1 MATERIALS

A. Crushed Rock: Section 02207.2.1.D – Coarse Aggregate Type A3-1 – Foundation Material for Unsuitable Subgrade

PART 3 EXECUTION

3.1 CONSTRUCTION METHODS:

A. The Developer/Contractor shall excavate all soils, which are soft or otherwise unusable for subgrade material.

B. Excavation of unusable soils shall be conducted so that acceptable material directly adjacent to the construction limits will not be disturbed.

C. The depth of excavation shall be determined by the City Engineer, but shall not be less than six (6) inches.

3.2 COMPACTION

A. The approved foundation material shall be placed and compacted to 95 percent of maximum density within two percent of optimum moisture as measured by ASTM D698, in six (6) inch lifts.

B. In place moisture-density test may be ordered by City of Longview to insure that all trench backfill complies with the requirements of the Specification.

3.3 DISPOSAL OF EXCESS MATERIAL

A. Excavated materials shall be handled at all times in such a manner as to cause a minimum inconvenience to public travel and to permit safe and convenient access to private and public property adjacent to or along the line of the Work.

B. In parkways and easements where it is necessary to deposit excavated materials on lawns during the Work, burlap or similar materials shall be placed on the lawn to prevent contact between excavated materials and the lawn.

C. Remove waste and excess excavated material from the construction site before final inspection.

D. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

E. All cost associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02245 - LIME SOIL STABILIZATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Item shall govern for treating the new or existing subgrade, the existing pavement structure or a combination thereof to be used as subgrade by pulverizing, adding lime, mixing, and compacting the mixed material as specified in this Item.

B. Lime Treatment for Materials used as Subgrade (8") shall be performed meeting the requirements of TxDOT Item 260 unless otherwise specified within this section.

C. Hydrated Lime for Lime Stabilized Subgrade shall be performed meeting the requirements of TxDOT Item 264 unless otherwise specified within this section.

1.2 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition.

B. ASTM C33 - Coarse Aggregates.

C. ASTM D698 - Moisture-Density Relations of Soils (Standard.)

D. ASTM D2487 - Classification of Soils for Engineering Purposes.

E. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

F. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.3 REGULATORY REQUIREMENTS

A. Perform Work in accordance with TxDOT Item 260 – Lime Treatment for Material Used as Subgrade (Road Mixed). See Section 01200 for Measurement and Payment.

B. Perform Work in accordance with TxDOT Item 264 – Lime and Lime Slurry. See Section 01200 for Measurement and Payment.

PART 2 PRODUCTS

2.1 MATERIALS

A. For this project, lime used shall be Type B Commercial Lime Slurry.

PART 3 EXECUTION

3.1 COMPACTION

A. Compaction shall be “Density Control as called for in TxDOT Item 260.4.(6).(b).

B. Each course shall be sprinkled as required and compacted to extend necessary to provide not less that 95 percent of maximum density within two percent of optimum moisture as measured by ASTM D698 and as shown on the typical section details.

3.2 DISPOSAL OF EXCESS MATERIAL

A. Excess materials shall be handled at all times in such a manner as to cause a minimum inconvenience to public travel and to permit safe and convenient access to private and public property adjacent to or along the line of the Work.

B. In parkways and easements where it is necessary to deposit excess materials on lawns during the Work, burlap or similar materials shall be placed on the lawn to prevent contact between excavated materials and the lawn.

C. Remove waste and excess excavated material from the construction site before final inspection.

D. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

E. All cost associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02246 - FLOWABLE FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Basic requirements for furnishing, mixing, and transporting flowable fill.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM C 150 – Standard Specification for Portland Cement
2. ASTM C 618 – Standard Specification for Coal Fly Ash and Raw Calcined Natural Pozzolan for Use in Concrete
3. ASTM C 94 – Standard Specification for Ready Mixed Concrete

1.3 SUBMITTALS

A. Reference Section 01300 for Submittal procedures.

B. Certificates: Submit mill certificates for bulk cement to be used in flowable fill mix.

C. Product Data: Manufacturer's data sheets for City of Longview approved additives and bonding agents.

D. Submit test data on proposed design mixes for the proposed mix design to be used in the Project.

1.4 QUALITY ASSURANCE

A. Project Controls: Provide necessary controls during evaluation of material, mix designs, production and delivery of flowable fill, placement, compaction, finishing and curing as necessary to assure that Work will be accomplished in accordance with the Contract Documents.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered, stored, and handled in a manner to prevent deterioration, contamination, or any other circumstance that would be harmful to the flowable fill mix.

1.6 PROJECT CONDITIONS

A. Do not place flowable fill during rain, sleet, or snow unless protection is provided and approved by the City of Longview.

B. Coordinate flowable fill placement schedule with other related Work.

C. Notify City Engineer at least 24 hours before placement.

PART 2 PRODUCTS

2.1 MATERIALS

A. Cement: ASTM C 150 unless otherwise approved by the City of Longview.

B. Fly Ash: ASTM C 618 – Class C or F unless otherwise approved by the City of Longview.

C. Water: ASTM C 94 unless otherwise approved by the City of Longview.

D. Fine Aggregate:

1. Natural or manufactured sand, or a combination thereof, free from injurious amounts of salt, alkali, vegetative matter or other objectable materials.

2. It is intended that the fine aggregate be fine enough to stay in suspension in the mortar to the extent required for proper flow.

3. The fine aggregate shall conform to the following gradation:

Sieve Size	% Passing
3/4 inch	100
No. 200	0 - 10

E. Admixtures: ASTM C 260 and/or C 494 unless otherwise approved by the City of Longview.

2.2 MIX DESIGN

A. The following typical mix designs are given to be used for trial mix purposes. Adjustments to the proportions shown may be made to achieve proper solid suspension and optimum flowability. Further, admixtures may be used if desired to improve the characteristics of the mix. Suggested quantities presented in dry materials per cubic yard are as follows:

Mix No. 1	
Cement	100 lbs.
Fly Ash	250 lbs.
Fine Aggregate	2,800 lbs.
Water (approx.)	60 gal.

Mix No. 2	
Cement	100 lbs.
Fly Ash	300 lbs.
Fine Aggregate	2600 lbs.
Water (approx.)	70 gal.

B. The Developer/Contractor shall submit the final proposed mix design to the City of Longview for approval prior to utilizing in the proposed Project.

C. Batching - Materials shall be measured by weight and/or volumetric methods.

D. Mixing - The flowable fill mix may be mixed in a central concrete mixer, a ready mix truck, or by other acceptable methods.

E. Transportation - Flowable fill shall be transported to the point of placement in a revolving drum mixer or in an agitator unit.

PART 3 EXECUTION

3.1 Install .as directed by the City of Longview.

3.2 Allow sufficient time for development of compressive strength prior to working on the surface.

3.3 Flowable fill with excessive shrinkage cracks, breaks, crumbing, and/or other unacceptable conditions shall be removed and replaced at the City of Longview's direction.

END OF SECTION

SECTION 02250 - CEMENT SOIL STABILIZATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section shall govern for treating the new or existing subgrade, the existing pavement structure or a combination thereof to be used as subgrade by pulverizing, adding cement, mixing, and compacting the mixed material as specified in this Item.

B. Cement Treatment for Materials used as subgrade shall be performed meeting the requirements of TxDOT Item 275 unless otherwise specified within this section.

1.2 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition or latest edition.

B. ASTM C33 - Coarse Aggregates.

C. ASTM D698 - Moisture-Density Relations of Soils (Standard.)

D. ASTM D2487 - Classification of Soils for Engineering Purposes.

E. ASTM D4254 - Minimum Index Density and Unit Weight of Soils and Calculations of Relative Density.

F. ASTM D4318 - Test for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.3 REGULATORY REQUIREMENTS

A. Perform Work in accordance with TxDOT Item 275 – Cement Treatment (Road Mixed).

PART 2 PRODUCTS

2.1 MATERIALS: For this project, cement used shall meet the requirements of DMS-4600, "Hydraulic Cement" and the Hydraulic Cement Quality Monitoring Program.

PART 3 EXECUTION

3.1 COMPACTION

A. Compaction shall be “Density Control as called for in TxDOT Item 275.4.(E).(2).

B. Each course shall be sprinkled as required and compacted to extend necessary to provide not less that 95 percent of maximum dry density at a moisture content ranging from four percentage points below to one percentage point above the Optimum moisture as measured by ASTM D698 and as shown on the typical section details.

3.2 DISPOSAL OF EXCESS MATERIAL

A. Excess materials shall be handled at all times in such a manner as to cause a minimum inconvenience to public travel and to permit safe and convenient access to private and public property adjacent to or along the line of the work.

B. In parkways and easements where it is necessary to deposit excess materials on lawns during the work, burlap or similar materials shall be placed on the lawn to prevent contact between excavated materials and the lawn.

C. Remove waste and excess excavated material from the construction site before final inspection.

D. Legally dispose of material at a licensed site or with written and notarized permission from the property owner for a private disposal site.

E. All cost associated with waste material removal and disposal shall be paid for by the Developer/Contractor.

END OF SECTION

SECTION 02314 - PIPELINES CROSSING HIGHWAYS, STREETS, AND RAILROADS

BY BORING, TUNNELING, OR OPEN CUT

PART 1 GENERAL

1.1 WORK INCLUDED

A. Furnish labor, materials, equipment and incidentals necessary to install pipe casings or tunnel liners by boring, tunneling or open cut as specified. This section sets forth the requirements for utility lines crossing roadways or railroads using bore, tunneling, or open cut.

1.2 QUALITY ASSURANCE

A. Installer's Qualifications:

1. Installation shall be by a competent, experienced Developer/Contractor or sub-contractor.

2. The installation contractor shall have a satisfactory experience record of at least three (3) years engaged in similar work of equal scope.

B. Performance Requirements:

1. Lateral or vertical variation in the final position of the pipe casing or tunnel liner from the line and grade established by the City of Longview shall be acceptable only to the extent that it does not impact the line and grade of the carrier pipe shown on the Plans.

2. If in the City of Longview’s opinion, the completed installation does not meet the intent of the design, the Work shall not be considered acceptable and shall be replaced.

1.3 SUBMITTALS

A. Submittals shall be in accordance with Section 01300, SUBMITTALS and shall include:

1. Provide shop drawings of casing insulators including sketches of insulators with material components and dimensions and proposed locations of insulators.

1.4 STANDARDS

A. AWWA C-206 – “Field Welding of Steel Water Pipe"

B. AWWA C-210 – "Liquid Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines"

C. AASHTO M-190 – "Bituminous Coated Corrugated Metal Culvert Pipe and Pipe Arches"

D. AASHTO – Standard Specifications for Highway Bridges, 1989.

E. ASTM A-36 – "Structural Steel"

F. ASTM A-123 – "Zinc (Hot Dipped Galvanized) Coatings on Iron and Steel Products"

G. ASTM A-135 – "Electric - Resistance - Welded Steel Pipe"

H. ASTM A-139 – "Electric - Fusion (Arc) - Welded Steel Pipe"

I. ASTM A-153 – "Zinc Coating (Hot Dip) on Iron and Steel Hardware"

J. ASTM A-307 – "Carbon Steel Bolts and Studs, 60,000 PSI Tensile"

K. ASTM A-449 – "Quenched and Tempered Steel Bolts and Studs"

L. ASTM A-569 – "Steel, Carbon, Hot-Rolled Sheet and Strip, Commercial Quality"

M. ASTM A-570 – "Hot Rolled Carbon Steel Sheet and Strip, Structural Quality"

N. ASTM C-76 – "Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe"

O. ASTM D-4254 – "Test Methods for Minimum Index Density of Soils and Calculation of Relative Density"

1.5 JOB CONDITIONS; PERMITS AND EASEMENT REQUIREMENTS

A. Where the work is in the public right-of-way or railroad company right-of-way, the Owner will secure the appropriate permits or easements.

1. The Developer/Contractor shall observe regulations and instructions of the right-of-way Owner as to the methods of performing the Work and take precautions for the safety of the property and the public.

2. Negotiations and coordination with the right-of-way Owner shall be carried on by the Developer/Contractor, not less than five (5) days prior to the time of his intentions to begin work on the right-of-way.

B. Comply with the requirements of the permit and/or easement.

1. The work within the Texas Department of Transportation (TxDOT) and Public Transportation shall comply with TxDOT specifications.

2. If required by the Right-of-Way Owner, obtain Protective Liability Insurance in the amount required by the particular company or other insurance as is specified in the permit at no cost to the Owner.

3. Acquire a permit, agreement, or work order from the right-of-way Owner as is required.

C. Construction along roads and railroads shall be performed in such manner that the excavated material be kept off the roads and railroads at all times, as well as, all operating equipment.

   1. Construction shall not interfere with the operations of the roads and railroads.

D. Barricades, warning signs, and flagmen, when necessary and specified, shall be provided by the Developer/Contractor.

E. No blasting shall be allowed.

F. Existing pipelines are to be protected.

   1. The Developer/Contractor shall verify location and elevation of any pipelines and telephone cable before proceeding with the construction and plan his construction so as to avoid damage to the existing pipelines or telephone cables.

   2. Verification of location of existing utilities shall be the complete responsibility of the Developer/Contractor.

1.6 OPTIONS

A. Casing Material:

   1. Unless specified otherwise, the Developer/Contractor shall use steel pipe for all casing pipe.

   2. The material specification for casing pipe and tunnel liner are the minimum acceptable.

   3. The Developer/Contractor shall be fully responsible to insure the materials used are of sufficient strength for the installation method chosen and the soil conditions encountered.

B. Bore And Tunnel Methods:

   1. Unless specified otherwise, the Developer/Contractor may use boring, and jacking for the installation method of casing material.

   2. The Developer/Contractor shall be fully responsible to insure the methods used are adequate for the protection of workers, pipe, property, and the public. Provide a finished product as required.

PART 2 PRODUCTS

2.1 MATERIALS

A. Steel Pipe:

   1. Steel casing pipe shall have a minimum yield strength of 35,000 psi.

2. Steel casing pipe to be installed with Union Pacific Railroad Right-of-way shall be coated with coal tar epoxy meeting the requirements of Corp of Engineers Specification C-200A. Coal tar epoxy shall be installed in two 8 mil coats for a total DFT of 16 mils. Welded joints shall be field coated. All other casing installed outside of Union Pacific Railroad Right-of-way may be uncoated.

3. Casing shall meet ASTM A-36, ASTM A-570, ASTM A-135, ASTM A-139, or City of Longview approved equal.

4. Pipe joints shall be welded in accordance with AWWA C-206.

5. Unless specified otherwise, the minimum wall thickness of steel casing pipe shall be as follows:

Casing Diameter	Wall Thickness
<12”	0.25”
13” - 18”	0.3125”
19” - 22”	0.375”
23” - 28”	0.4375”
29” - 34”	0.50”
35” - 42”	0.5625”
43” - 48”	0.625”

2.2 MIXES

A. Cement Mortar:

1. Consisting of one (1) part cement to two (2) parts clean sand with sufficient water to make a thick workable mix.

B. Pressure Grout Mix:

1. Comprised of 1 cubic foot of cement and 3.5 cubic feet of clean fine sand with sufficient water added to provide a free flowing thick slurry.

2. If desired to maintain solids in the mixture in suspension, one cubic foot of commercial grade bentonite may be added to each 12 to 15 cubic feet of the slurry.

2.3 MANUFACTURED PRODUCTS

A. Casing Insulators:

1. Use casing insulators for all types of carrier pipe.

2. Insulators shall consist of pre-manufactured steel bands with plastic lining and plastic runners.

3. Insulators shall fit snug over the carrier pipe and position the carrier pipe approximately in the center of the casing pipe, to provide adequate clearance between the carrier pipe bell and the casing pipe.

4. Fasteners for insulators shall be stainless steel.

5. Insulators shall be as manufactured by Advanced Product and Systems, Inc., Model #SSI, or City of Longview approved equal.

B. End Seals:

1. All casing shall be sealed.

2. Seals shall be one-piece rubber with stainless steel bands.

3. End seal shall be molded to fit the casing pipe and carrier pipe.

4. Advanced Product and Systems, Model #AC or City of Longview approved equal.

PART 3 EXECUTION

3.1 GENERAL CONSTRUCTION PROCEDURES

A. Excavation And Backfill Of Access Pits

1. Do not allow excavation over the limits of the bore or tunnel as specified.

    a. Trench walls of access pits adjacent to the bore or tunnel face shall be truly vertical.
    b. Shore the trench walls as necessary to protect workmen, the public, structures, roadways, and other improvements.

2. Excavations within the right-of-way and not under surfacing shall be backfilled and consolidated by tamping in 6" horizontal layers to 95% of maximum density as measured by ASTM D-698.

    a. Surplus material shall be removed from the right-of-way and the excavation finished to original grades.
    b. Backfill pits immediately after the installation of the carrier pipe is completed.
    c. If carrier pipe is not installed immediately after casing pipe installation, the Right-of-Way Owner may require the access pits be temporarily backfilled until installation of carrier pipe.

3. Where seeding or sodding is disturbed by excavation or backfilling operations, such areas shall be replaced by seeding or sodding as specified.

B. Installing Carrier Pipe In Casings

1. Pipe to be installed within the casing or tunnel liner shall meet the requirements for this type of pipe as specified.

    a. Where indicated, place, align, and anchor guide rails and/or casing insulators inside the casing.
    b. If guide rails are used, place cement mortar on both sides of the rails.

2. Pull or skid pipe into place inside the casing.

    a. Lubricants such as flax soap or drilling mud may be used to ease pipe installation.
    b. Do not use petroleum products, oil or grease for this purpose.
    c. If guide rails are used, install pipe and hold down jacks after installation of carrier pipe.

3. After installation of the carrier pipe, mortar inside and outside of the joints as applicable.

4. After carrier pipe installation is complete, install required end seals at each end of the casing.

C. Free-Air System:

1. If required by OSHA standards, free-air systems shall be installed and maintained.

D. Installation Of Pressure Grout Mix

1. Install pressure grout mix in the void space between the outside of the casing pipe or tunnel liner and the excavation.

2. For bore or jacks with casing pipe, install pressure grout mix immediately upon completion of setting casing pipe.

3.2 CROSSINGS INSTALLED BY BORING

A. Perform the boring from the low or downstream end unless specified otherwise.

1. The casing bore shall be done by auger type boring method. The casing bore shall not be done by directional drilling unless approved by the City of Longview prior to bidding.

2. Place excavated material near the top of the working pit and dispose of material as required.

3. Jetting shall not be permitted.

B. In unconsolidated soil formations, a gel-forming colloidal drilling fluid consisting of at least 10% of high grade carefully processed bentonite may be used to consolidate cuttings of the bit, seal the walls of the hole, and furnish lubrication for subsequent removal of cuttings and installation of the pipe immediately thereafter.

C. In locations where the soil formation is other than consolidated rock, insert the casing pipe simultaneously with the boring operation.

1. This requirement applies to all bored holes of 18" or greater in diameter.

2. For smaller diameter bored holes, it is desirable that the casing be installed as the boring progresses, but because of differences in soil formations, the time for inserting the casing shall be the Developer/Contractor's responsibility.

3. In the event that caving sand or water bearing materials are encountered, insert the casing pipe simultaneously with the boring operation regardless of the diameter of the bored hole.

4. In all cases, the security and integrity of the roadway is the primary concern.

5. The Developer/Contractor shall be held fully responsible for the continued integrity of the structure of the roadway being crossed, whether or not a casing pipe is inserted simultaneously with the boring operation.

3.3 CROSSINGS INSTALLED BY TUNNELING AND JACKING

A. Jack the pipe from the low or downstream end, unless specified otherwise.

1. Provide heavy-duty jacks suitable for forcing the pipe through the embankment.

2. In operating jacks, apply even pressure to the jacks used.

3. Provide a suitable jacking head and bracing between jacks so that pressure will be applied to the pipe uniformly around the ring of the pipe.

4. Provide a suitable jacking frame or backstop.

5. Set the pipe to be jacked on guides, properly braced together, to support the section of the pipe and to direct it in the proper line and grade.

6. Place the whole jacking assembly so as to line up with the direction and grade of the pipe.

7. In general, excavate embankment material just ahead of the pipe and material removed through the pipe.

8. Force the pipe through the embankment with jacks into the space provided.

B. The excavation for the underside of the pipe, for at least 1/3 of the circumference of the pipe, shall conform to the contour and grade of the pipe.

1. Provide a clearance of not more than 2" for the upper half of the pipe.

2. This clearance shall be tapered off to zero at the point where the excavation conforms to the contour of the pipe.

3. Extend the distance of the excavation beyond the end of the pipe depending on the character of the material, but do not exceed 2' in any case.

4. Decrease the distance if the character of the material being excavated makes it desirable to keep the advance excavation closer to the end of the pipe.

C. If desired, use a cutting edge of steel plate around the head end of the pipe extending a short distance beyond the end of the pipe with inside angles or lugs to keep the cutting edge from slipping back onto pipe.

D. When jacking of pipe has begun, carry on the operation without interruption to prevent the pipe from becoming firmly set in the embankment.

1. Remove and replace any pipe damaged in the jacking operations.

2. The Developer/Contractor shall absorb the entire expense.

3.4 CROSSINGS WITH CASING INSTALLED BY OPEN CUT

A. This article covers the requirements for the construction of crossings where pipe casing is required for installation by the open cut method.

B. Excavation, backfill, and embedment of casing pipe shall be as specified.

C. Casing shall be bedded in gravel material to the springline of the casing.

D. Developer/Contractor shall backfill with select fill material compacted in 8-inch lifts.

E. Developer/Contractor shall complete the backfill and repair the pavement section as shown.

F. If settlement occurs, the pavements shall be removed and the trench recompacted at the Developer/Contractor’s expense.

END OF SECTION

SECTION 02370 - EROSION CONTROL FABRIC

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Erosion control fabric

1.2 SUBMITTALS FOR REVIEW

A. Submit 8” x 8” sample if not by pre-approved supplier and product data sheets for materials to be used.

1.3 QUALITY CONTROL

A. Pre-approved Acceptable Manufacturers

1. American Excelsior Company, Arlington, Texas
2. Erosion Control Systems, Inc., Tuscaloosa, Alabama

PART 2 PRODUCTS

2.1 MATERIALS

A. Blanket:

1. Plastic reinforced excelsior blanket shall be used for erosion control.
2. Blanket shall be a machine produced mat of curled wood excelsior covered on one side with a photo-degradable plastic mesh.
3. Product weight shall be 1.0 pounds per square yard +/- 10%.

B. Staples:

1. Staples shall be make of uncoated steel wire to provide for rapid decomposition.
2. Staples shall be 10-gauge, U-shaped, with a length of 6 inches.

PART 3 EXECUTION

3.1 APPLICATION

A. The area to be covered shall be prepared, fertilized, and seeded in accordance with Section 02936-Seeding before the blanket is applied.

B. The blanket shall be unrolled down-slope with the plastic netting on top.

1. It is essential that the length of the blanket be parallel to the flow surface runoff.

2. Care should be taken to insure coverage of the entire area as designated without leaving gaps between the blankets.

3. Staples shall be driven through the blanket into the ground at 6-foot intervals along the length of the blanket, and 2-foot intervals along the width of the blanket.

C. Butted joints of adjacent blankets shall be fastened together along the joint with a single row of staples along the length of the blanket. This stapling procedure should result in use of staples at the rate of 0.75 staples per square yard of blanket.

3.2 SCHEDULE

A. Erosion control matting shall be used on all slopes greater than 3:1 and in locations shown on the plans.

END OF SECTION

SECTION 02375 - FILTER FABRIC FENCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Filter fabric fence

1.2 DESCRIPTION

A. This Item describes the installation of filter fabric fences utilized during construction and prior to the final development of the site.

1.3 SUBMITTALS FOR REVIEW

A. Manufacturer's catalogue sheets and other pertinent information on geotextile fabric.

PART 2 PRODUCTS

2.1 FILTER FABRIC

A. Provide woven or nonwoven geotextile filter fabric made of either polypropylene, polyethylene, ethylene, or polyamide material.

B. Geotextile fabric shall have a grab strength of 100 psi in any principle direction (ASTM D-4632), Mullen burst strength exceeding 200 psi (ASTM D-3786), and the equivalent opening size of between 20 and 50.

C. Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 ° F to 120°F.

PART 3 EXECUTION

3.1 FILTER FABRIC

A. Provide erosion and sedimentation control systems at the locations shown on the construction plan/profile sheets or as directed by the City of Longview. Such systems shall be of the type indicated and shall be constructed in accordance with the requirements shown on the construction plan/profile sheets and set out in this Item.

B. Inspect and repair or replace components of all erosion and sedimentation control systems as specified for each system.

   1. Unless otherwise directed, maintain the erosion and sedimentation control systems until the project is accepted by the Owner.

   2. Remove erosion and sedimentation control systems promptly, in an appropriate manner, when directed by the Owner.

C. Remove and dispose of sediment deposits off-site.

  1. Off-site disposal will be the responsibility of the Developer/Contractor.

  2. Sediment shall not be allowed to flush into streams or drainage ways.

  3. If sediment has been contaminated, it shall be disposed of in accordance with existing federal, state and local regulations.

D. Damage caused by construction traffic to erosion and sedimentation control systems shall be repaired immediately at the expense of the Developer/Contractor.

E. Conduct all construction operations under this Contract in conformance with the erosion control practices described.

3.2 CONSTRUCTION METHODS

A. Provide filter fabric fence systems at locations specified in accordance with the construction plan/profile sheets. Filter fabric fence systems shall be installed in such a manner that surface runoff will percolate through the system in sheet flow fashion and allow sediment to be retained and accumulated.

B. Attach the filter fabric and wire to 2 inch by 2 inch wooden stakes or 1.00-1.33 lb./linear foot steel posts spaced no more than six feet apart and embedded at least one foot deep.

  1. All stakes shall be installed perpendicular to the slope of the land.

  2. Steel posts shall have projections for fastening wire and/or fabric.

C. Trench in the toe of the filter fabric fence with a spade or mechanical trencher so that the downward face of the trench is flat and perpendicular to the direction of flow (as shown on the drawing included at the end of this Section).

  1. Lay filter fabric and wire along the edges and bottom of the trench.

  2. Backfill and compact the trench.

D. The filter fabric and wire should be provided in continuous rolls and cut to the length of the Silt Fence to minimize the use of joints.

  1. When joints are necessary, the fabric and wire should only be spliced together at a support post and have at least six inches of overlap.

  2. The joint shall be securely sealed.

E. Inspection of sediment filter barrier systems shall occur after each rainfall or daily during periods of prolonged rainfall. Inspection shall occur at least once a week during rainless periods.

  1. Repair or replace damaged section immediately to restore the requirements of this Item.

2. Sediment deposits shall be removed when they reach one-third of the height of the fence.

END OF SECTION

SECTION 02450 - LANDSCAPING

PART 1 GENERAL

1.1 GENERAL CONDITIONS

A. The Developer/Contractor shall obtain and pay for any and all permits and all inspections as required.

B. All local, municipal and state laws, and rules and regulations governing or in relation to any portion of this Work are hereby incorporated into and made a part of these Specifications.

1. Anything contained in these Specifications shall not be construed to conflict with any of the above rules and regulations or requirements of the same.

2. However, when these Specifications and Plans call for or describe materials, workmanship, or construction of a better quality, higher standard, or larger size than is required by the above rules, regulations, the provisions of these Specifications and Plans shall take precedence.

C. The City of Longview has the authority to stop work whenever such stoppage may be necessary to insure the proper execution of the Contract.

D. The City of Longview has the right to select all plant materials at the nursery or field source or Developer/Contractor’s holding yard or to reject material that does not meet specifications.

E. The City of Longview will not engage in any way to superintend so as to relieve the Developer/Contractor of responsibility for the complete and proper execution of the work, nor the consequences of neglect or carelessness by him or his subordinates.

F. The Developer/Contractor, before submitting planting plans, shall locate all necessary materials as called for in the project and shall be assured of their availability for use on the Project.

PART 2 MATERIALS

2.1 PLANTS

A. The amounts shown are to serve as an aid, quantities necessary to complete the project should be determined from the planting plan and the site. Revisions may be necessary if changes are made as work progresses.

B. All plants shall equal or exceed the measurements specified in the Plans as shown which are minimum acceptable sizes. A plant shall be measured as it stands in its natural position and before pruning, with its branches in normal position. Any necessary pruning shall be done at the time of planting.

C. Plants shall have a habit of growth, which is normal for the species and shall be sound, healthy, vigorous and free of insects, plant diseases, injuries and after effects thereof.

D. Substitutions will be permitted only upon approval and authorization of the City of Longview.

E. All plants shall conform to the standards as set forth and established by the AMERICAN STANDARDS FOR NURSERY STOCK and the AMERICAN JOINT COMITTEE ON HORTICULTURAL NOMENCLATURE, Latest edition of Standardized Plant Names.

F. All plant materials shall be inspected by the City of Longview prior to planting.

2.2 WATER: Water shall be furnished by the Developer/Contractor. Hoses and other watering equipment necessary to supplement the irrigation system shall be furnished by the Developer/Contractor.

2.3 MULCH: Mulch materials shall be hardwood, or other collected humus, character not easily displaced by wind or rain.

2.4 COMMERCIAL FERTILIZER

A. Lawn and planting bed fertilizer shall be a complete fertilizer containing the following minimums percentages by weight: 10% nitrogen, 20% phosphorus, 10% potash.

B. Commercial fertilizer shall conform to all applicable state fertilizer laws, shall be delivered in original unopened container, each bearing the manufacturer’s guarantee analysis and shall be uniform in composition, dry, and free flowing.

2.5 PRE-EMERGENT HERBICIDE: Pre-emergent herbicide shall be Eptam Granules or City of Longview pre-approved equal, applied at the manufacturer’s recommended rate.

PART 3 EXECUTION

3.1 PLANTING BEDS

A. General: All areas to receive shrubs and ground cover shall be prepared according to standard horticultural practice, removing existing grass or undesired vegetation and foreign matter.

B. Shrubs and ground cover beds shall be filled with four to six inches (4” – 6”) of sandy loam topsoil.

C. After assuring compliance with requirement B., above, the shrub or planting beds shall be covered with a uniform layer of four (4”) inches of composted cotton burr mulch. This organic planting medium shall then be tilled to a depth of six (6”) to eight (8”) inches and thoroughly mixed with the topsoil.

D. After planting of materials in defined bed areas, a two (2”) to three (3”) inch layer of mulch shall be spread around plant materials in a manner to provide a uniform covering of all areas of the beds.

E. Finish grade in planting beds shall be one (1”) below concrete of other finish grades.

F. The Developer/Contractor shall investigate the locations of all underground utilities to avoid conflict with the landscape installation, and shall report any major problems to the City of Longview prior to proceeding with the installation of the plant materials.

3.2 HANDLING OF PLANT MATERIALS

A. All plants shall be handled in such a manner as to avoid unnecessary damage of any kind.

B. Roots shall be especially protected at all times from drying.

3.3 PLANTING OPERATIONS

A. General: The Developer/Contractor shall begin planting when other divisions of this work have progressed.

B. All plants shall be set at such a level, that after settlement, they bear the same relationship to the finished grade of the soil from which they were growing.

C. Carefully insert plants into prepared soil beds at slightly above finished grade.

1. When all plants are in place, rake the entire bed area smooth, water and allow to soak well.
2. After settlements, add soil as necessary to re-establish finish grade.

D. All trees shall have an eighteen (18”) inch diameter earth saucer around them and shall receive two (2”) inches of mulch, as specified.

E. After the planting is completed, all cultivated areas shall be leveled, loosened, and the edges carefully rimmed so that the tree pits and beds shall present a neat appearance. Care shall be used that the beds conform as closely as possible to the lines shown on the planting plan.

F. Thoroughly water all plants immediately after planting.

1. This shall mean full and thorough saturation of all backfill in the pits and beds during the same day of planting.
2. Backfill shall be placed in layers with the layers watered sufficiently to settle the soil before the next layer is placed.
3. Apply water only by open end hose at a very low pressure to avoid air pockets and injury to the roots.
4. When planted, watered, and fully settled, the plants shall be vertical or as appropriate for root ball and to set the tree to proper grade.

G. TREE PLANTING

1. Excavate holes for planting trees twelve (12) inches greater than the diameter of the root ball for each tree being planted.
2. Back fill for planting trees shall be sandy loam topsoil, ground pine bark mulch, and excavated (approved) topsoil, well mixed, at the following ratio of one part mulch, one part topsoil, and one part excavated topsoil.
3. The holes for planting trees shall have a minimum depth of twenty-four (24”) inches.
4. All lime stabilized base material in the hole shall be removed and replaced with the previously stated backfill.

H. SHRUB PLANTING

1. Excavate the holes for planting shrubs one and one half times greater than the diameter of the root ball or container of the shrub being planted plus 4” to accommodate the cotton burr compost.
2. Set the plants with their fullest side forward and plumb and straighten plants in the planting holes with regard to the top growth of the plant.
3. All plants are to be set such that the finish grade rests at a level even with the top of the soil.
4. Allow for future settling.
5. Backfill and water in shrubs in the same manner prescribed for the trees.

I. GROUND COVERS

1. All ground covers shall be planted in beds of sandy loam topsoil as prescribed above.
2. Plants shall not be planted at a level deeper than the level of soil in the original container with trailing stems and rhizomes laid out in a manner such as to minimize damage to the plant material, and to favor the rapid establishment and growing of the plant material in the planting beds.
3. After planting, water all ground cover beds thoroughly to a depth of four (4”) inches.

J. All plants shall be thoroughly watered in at the time of planting and as necessary until final acceptance of the installation by the Owner. After watering and establishment all planted areas shall be raked smooth and covered with a layer of two (2”) inches shredded hardwood bark mulch to provide a finished appearance.

K. All trees planted in the planter areas shall have “trunk guards” installed around the base of their trunks. Type and brand must be as noted or pre-approved by the City of Longview.

L. All planters shall be supplied with a DeepRoot Universal Guide UB-24-2 as manufactured by DeepRoot Partners or City of Longview pre-approved equal.

3.4 SETTING, STAKING, AND WRAPPING OF TREES

A. Trees shall be set plumb by adjusting the root ball.

B. All trees shall be bi-staked immediately after planting.

C. All trees shall be wrapped with commercial tree wrap, up to four (4') or five (5') feet high on the trunk.

3.5 PRUNING

A. The amount of pruning shall be limited to the minimum necessary to remove dead or injured twigs and branches and to compensate for the loss of roots during transplanting, but never to exceed one third of the branching structure.

B. Pruning shall be done in such a manner as to not change the natural habit or shape of the plant.

C. All cuts shall be made flush, leaving no stubs. Cuts over one (1") inch in diameter shall be cut back to sound tissue, smoothed and shaped so as not to hold water and painted with approved tree wound dressing.

3.6 PRE-EMERGENT HERBICIDE: All bed areas shall have Eptam Granules (or City of Longview pre-approved equal) applied at the manufacturer's recommended rates before the installation of the plant material.

3.7 CLEAN-UP

A. During the Work, the premises are to be kept neat and orderly at all times.

B. Storage areas for plants and other materials shall be so organized that they too are neat and orderly.

C. All trash, including debris resulting form removal of weeds or rock from planting areas, preparing beds, or installation of plants shall be removed from the site daily as the work progresses.

D. All walks and drives shall be kept clean by sweeping and/or hosing; excavated soil may be distributed on the site as directed by the City of Longview.

END OF SECTION

SECTION 02510 - ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Asphaltic concrete paving, wearing binder or base course.

1.2 RELATED SECTIONS

A. Section 02607 - Manholes and Covers: Manholes including frames.

1.3 REFERENCES

A. ASTM D946 - Penetration-Graded Asphalt Cement for Use in Pavement Construction.

B. TAI - (The Asphalt Institute) - MS-2 Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.

C. TAI - (The Asphalt Institute) - MS-3 Asphalt Plant Manual.

D. TAI - (The Asphalt Institute) - MS-8 Asphalt Paving Manual.

E. TAI - (The Asphalt Institute) - MS-19 Basic Asphalt Emulsion Manual.

F. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges 2014.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with TxDOT Item 340.

B. Mixing Plant: Conform to TxDOT Items 302.5 and 340.4.

C. Obtain materials from same source throughout.

D. If there are any discrepancies between specifications, the more stringent one with be applicable.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable TxDOT Item 340 for paving work.

1.6 ENVIRONMENTAL REQUIREMENTS

A. Do not place asphalt when ambient air is as described in TxDOT Item 340.6.1.

B. Place bitumen mixture when temperature is as specified in TxDOT Items 360.5 and 340.6.

PART 2 PRODUCTS

2.1 MATERIALS

A. Asphalt Cement: In accordance with TxDOT Items 340 and 300.

B. Aggregate for Base Course Mix: In accordance with TxDOT Item 340 Type "B". Use Longview Asphalt mix design H05-08 or City of Longview approved equal.

C. Aggregate for Wearing Course Mix: In accordance with TxDOT Item 340 Type "D". Use Longview Asphalt mix design H06-09 or City of Longview approved equal.

D. Coarse Aggregate: In accordance with TxDOT Item 340. Use TXI Bridgeport limestone or City of Longview approved equal.

E. Fine Aggregate: In accordance with TxDOT Item 340. Use Madden Cherry Pit field sand or City of Longview approved equal.

F. Mineral Filler (Screenings): Finely ground particles of limestone, hydrated lime or other mineral dust, free of foreign matter in accordance with TxDOT Item 340. Use TXI Bridgeport limestone screenings or City of Longview approved equal.

G. Primer: Cut-back asphaltic material in accordance with TxDOT Item 310 (MC-30).

H. Tack Coat: Homogeneous, medium curing, liquid asphalt in accordance with TxDOT Item 340 (CRS-2H).

2.2 ASPHALT PAVING MIX

A. Use dry material to avoid foaming, mix uniformly, and meet properties as described in TxDOT Item 300.

B. Base Course: In accordance with TxDOT Item 340, Type A or B is not to exceed 5 inch compacted lifts.

C. Wearing Course: In accordance with TxDOT Item 340, Type D Fine-Graded Surface Course exceed 3 inch compacted lifts.

2.3 SOURCE QUALITY CONTROL AND TESTS

A. Section 01400 - Quality Control: Provide mix design for asphalt.

B. Submit proposed mix design of each class of mix for review prior to beginning of work.

C. Test samples in accordance with TxDOT Item 340 testing guides and schedules.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that compacted subgrade, granular base, and/or stabilized soil is dry and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.2 SUBGRADE

A. 8 inches of mechanically reworked, stabilized, and compacted soils. The top 8 inches shall be lime or cement treated.

3.3 PREPARATION - PRIMER

A. Apply primer in accordance with manufacturer's instructions and per TxDOT Item 310 standards.

B. Apply primer to contact surfaces of curbs, gutters, and other inlayed structures.

C. Use clean sand to blot excess primer.

3.4 PREPARATION - TACK COAT

A. Apply tack coat in accordance with manufacturer's instructions and per TxDOT standards.

B. Apply tack coat to contact surfaces of curbs, gutters and other inlayed structures.

C. Coat surfaces of manhole and catch basin frames with oil to prevent bond with asphalt pavement. Do not tack coat these surfaces.

D. Clean up any excess asphalt off of these surfaces before the end of each day.

3.5 PLACING ASPHALT PAVEMENT - SINGLE COURSE

A. Install Work in accordance with TxDOT Item 340.

B. Place asphalt within two to four (2-4) hours of applying primer or tack coat.

C. Place to three (3) inches compacted thickness.

D. Install gutter drainage grilles and frames and manhole frames in correct position and elevation.

E. Compact pavement by rolling to specified density. Do not displace or extrude pavement from position. Hand compact in areas inaccessible to rolling equipment.

F. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks.

3.6 CURBS

A. Install concrete curb and gutter section before asphaltic concrete paving as shown on the Plans.

3.7 TOLERANCES

A. Flatness: Maximum variation of ¼ inch measured with a 10-foot straight edge.

B. Scheduled Compacted Thickness: Within ¼ inch.

C. Variation from True Elevation: Within ½ inch.

3.8 FIELD QUALITY CONTROL

A. Section 01400 - Quality Control: Provide field inspection and testing.

B. Take samples and perform tests in accordance with TxDOT Items 340.

3.9 PROTECTION

A. Immediately after placement, protect pavement from mechanical injury until surface temperature is less than 140 degrees F.

END OF SECTION

SECTION 02511 - PAVEMENT REPAIR

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The repair and replacement of an open-cut trench pavement section within the confines of an existing roadway pavement section including, but not limited to, asphalt (hot-mix, surface treatment, etc.), brick, concrete, gravel, oil-sand, and unimproved streets and roadways.

1.2 REFERENCES

A. TxDOT Item 247 – Flexible Base Material

B. TxDOT Item 300 – Asphalts, Oils, and Emulsions

C. TxDOT Item 310 – Prime Coat (cutback asphaltic material only)

D. TxDOT Item 340 – Hot Mix Asphaltic Concrete Pavement

E. TxDOT Item 360 – Concrete Pavement

F. TxDOT Item 421 – Portland Cement Concrete

G. TxDOT Item 433 – Joint Sealant and Fillers

H. TxDOT Item 536 – Membrane Curing

I. ACI 301 – Specifications for Structural Concrete

J. ASTM A615 – Deformed and Plain Billet Steel Bars

K. ASTM A616 – Rail Steel Deformed and Plain Bars

L. ASTM C260 – Air-Entraining Admixtures for Concrete

M. ASTM C494 – Chemical Admixtures for Concrete

1.3 SUBMITTALS

A. Procedures for Submittals: Section 01300.

B. Developer/Contractor shall certify the asphalt/concrete mixing plant will conform to the requirements of the TxDOT Standard Specifications for Construction of Highways, Streets, and Bridges, 2014 Edition.

C. Developer/Contractor shall submit design mixtures for asphalt/concrete, including additive modifiers, for review and approval at least 30 days before any pavement is placed.

1.4 DELIVERY, STORAGE AND HANDLING

A. Asphaltic Concrete Material shall be hauled in tight trucks previously cleaned of all dirt and foreign material.

B. All material shall be delivered and immediately placed or stockpiled. Care shall be taken when stockpiling to prevent contamination of materials.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Asphaltic Concrete shall not be placed when the ambient temperature is below 60 degrees F and is falling.

B. Asphaltic Concrete may be mixed and placed when the ambient temperature is above 50 degrees F and is rising.

C. Portland Cement Concrete shall not be placed when the ambient temperature is above 40 degrees F and falling.

D. Portland Cement Concrete may be placed when the ambient temperature is above 35 degrees F and rising.

E. Paving materials shall not be placed on wet or frozen subgrade.

PART 2 PRODUCTS

2.1 FLEXIBLE BASE

A. TxDOT Item 247, Type A, Grade 2.

2.2 PRIME COAT

A. Asphaltic Materials: TxDOT Item 300, "Asphalts, Oils and Emulsions."

B. Provide grade MC-30, or as approved by the City of Longview, in accordance with TxDOT Item 310, "Prime Coat."

2.3 TACK COAT

A. Asphaltic Materials: TxDOT Item 300, "Asphalts, Oils and Emulsions."

B. Provide grade CRS-H, or as approved by the City of Longview.

2.4 HOT MIX ASPHALTIC CONCRETE SURFACE COURSE:

A. TxDOT Item 340, Type D.

2.5 REINFORCEMENT

A. Reinforcing steel shall meet the requirements of ASTM A616, Grade 60 new billet steel bars.

B. Dowels for expansion joints shall meet the requirements of ASTM A615, Grade 60.

2.6 PORTLAND CEMENT CONCRETE

A. Use either Type I or Type III, ASTM C-150 concrete.

B. Concrete mix shall be TxDOT Class P having a minimum cement content of six (6) sacks per cubic yard and compressive strength of 4,400 psi.

C. Mixing water shall be potable and not detrimental to the concrete.

D. The concrete shall contain 5 to 7 percent entrained air and shall meet the requirements of ASTM C260.

E. Do not use chemical admixtures such as water reducing, retarding and accelerating agents unless approved by the City of Longview. If admixtures are approved, they shall meet the requirements of ASTM C494.

PART 3 EXECUTION

3.1 EXTENT OF REPAIR

A. Roadway/street shall be restored to its original condition or better as depicted on the Plans.

B. The Developer/Contractor shall repair all pavement cuts, unless otherwise noted on the Plans.

3.2 FIELD QUALITY CONTROL

A. The trench backfill supporting the pavement replacement shall be installed in accordance with Section 02225.

B. If, in the judgment of the City of Longview, the quality of materials used or the completed installation (including compacted density, surface thickness or surface texture) is questionable, the City of Longview may conduct the appropriate tests to verify the quality of the installation.

   1. If the installation does not meet the criteria listed in this section, the material shall be removed and replaced at the expense of the Developer/Contractor such that the installation meets the criteria in this section.

   2. If the installation does not meet the criteria listed in this section, the tests will be at the expense of the Developer/Contractor.

3.3 BARRICADES

A. The Developer/Contractor shall maintain lights and barricades around the work areas until the pavement is ready for traffic.

B. Control work so as to minimize disruption of normal traffic flow and prevention of access to normal traffic routes.

3.4 GRAVEL, OIL-SAND AND OTHER NON-PERMANENT ROADWAYS

A. Ensure trench is backfilled in accordance with section 02225.

B. Place and compact a finished ten (10) inch layer of flexible base material over the ditch as shown on the Drawings for the finished surface of the roadway.

C. The thickness of each layer before compaction shall not exceed six (6) inches.

3.5 ASPHALTIC CONCRETE ROADWAYS

A. Ensure trench is backfilled in accordance with section 02225.

B. Flexible Base Course:

1. Place and compact flexible base course under pavement sections over the ditch within roadways as shown on the Plans.
2. The thickness of each layer before compaction shall not exceed six (6) inches.

C. Prime Coat:

1. Prime coat shall be applied at a rate of 0.25 gallons per square yard over compacted flexible base and shall be cured for 24 hours minimum.

D. Tack Coat:

1. Shall be applied to saw-cut edges, adjacent concrete or other appurtenances within the confines of the paved area.
2. Apply at a rate of 0.10 gallons per square yard.

E. Laying:

1. Shall meet the requirements of TxDOT Item 334, or as approved by the City of Longview.

F. Compacting:

1. Developer/Contractor shall use any equipment deemed necessary.
2. All equipment shall be approved by the City of Longview.

G. Density:

1. As specified within TxDOT Item 334.

H. Surface Tests:

1. The finished surface of the replacement asphalt shall be at the same elevation and grade as the original pavement before cutting, or as shown on the Drawings.

2. The completed surface, when tested with a straightedge spanning between the undisturbed saw-cut pavement sections at the adjacent trench walls, shall show no deviation in excess of 1/16 inch per foot from the sawed edge.

I. Construction Joints

1. Place courses as nearly continuously as possible.
    a. If work is interrupted, cut back the previously-laid material to produce a slightly beveled edge for the full thickness of the course.
    b. Remove old material which has been cut away and lay the new mix against the fresh cut.

2. When the asphalt is laid against existing or old asphalt, the existing or old asphalt shall be cut to provide a straight smooth joint.

3. Apply tack coat to old asphalt edge as previously described in this specification, prior to laying new material.

3.6 PORTLAND CEMENT CONCRETE PAVEMENT

A. Ensure trench is backfilled and compacted in accordance with City of Longview standards.

B. Preparation:

1. Moisten underlaying pavement layer to minimize absorption of water from fresh concrete.

2. Coat surfaces of manholes, drop inlets, etc. with oil to prevent bond with concrete.

C. Forming:

1. If available, use adjacent saw-cut edges of existing concrete pavement as forms to match grade.

2. Use forming as necessary to contain the placed concrete when saw-cut edges are not available on both sides of the trench (ie. ditch is parallel to and at the edge of the roadway).

3. Ensure completed edge of concrete matches the line and grade of adjacent roadway, if no grade changes are depicted on the Plans.

4. Thickness of placed concrete shall match existing pavement.

D. Reinforcement:

1. If reinforcement is required, the size and location will be shown on the Plans.

E. Concrete Pavement:

1. Place concrete in accordance with TxDOT Item 360--Concrete Pavement, unless otherwise noted.
2. Place concrete over the ditch within roadways as shown on the Drawings.
3. Ensure reinforcement, inserts, embedded parts, formed joints, etc. are not disturbed during concrete placement.
4. Match pattern of expansion/control joints in existing concrete pavement.
5. Finished surface of concrete shall match the existing pavement.

F. Surface Tests:

1. The finished surface of the replacement concrete shall be at the same elevation and grade as the original pavement before cutting, or as shown on the Plans.
2. The completed surface, when tested with a straightedge spanning between the undisturbed saw-cut pavement section as the adjacent trench walls, shall show no deviation in excess of 1/16 inch per foot from the sawed edge.

END OF SECTION

SECTION 02520 - PORTLAND CEMENT CONCRETE PAVING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete sidewalks, stair steps, integral curbs, gutters, parking areas, and roads.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 02224 - Excavation, Backfilling and Compacting for Structures.

C. Section 02245 - Lime Soil Stabilization.

D. Section 02530 - Concrete Curb and Gutter.

E. Section 02580 - Pavement Markings.

F. Section 02923 - Landscape Grading

G. Section 03300 - Cast-In-Place Concrete.

1.3 REFERENCES

A. ACI 301 - Specifications for Structural Concrete for Buildings.

B. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.

C. ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.

D. ASTM A615 - Deformed and Plain Billet-Steel for Concrete Reinforcement.

E. ASTM A616 Grade 60 – Reinforcing Steel.

F. ASTM C33 - Concrete Aggregates.

G. ASTM C94 - Ready Mix Concrete.

H. ASTM C150 - Portland Cement

I. ASTM C260 - Air-Entraining Admixtures for Concrete.

J. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

K. ASTM C494 - Chemical Admixtures for Concrete.

L. ASTM D1751 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction.

M. ASTM D1752 - Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

N. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges (2014).

  1. Item 360 – Concrete Pavement.
  2. Item 420 – Concrete Structures.
  3. Item 421 – Portland Cement Concrete.
  4. Item 433 – Joint Sealers and Fillers.
  5. Item 437 – Concrete Admixtures.
  6. Item 440 – Reinforcing Steel.
  7. Item 526 – Membrane Curing.
  8. Item 529 – Concrete Curb, Gutter and Combined Curb and Gutter.

1.4 PERFORMANCE REQUIREMENTS

A. Paving: Designed for parking movement of trucks up to 60,000 lbs.

1.5 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide data on concrete mix design, joint filler, admixtures, and curing compounds.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301, the City of Longview standard, and TxDOT. Wherever there is a discrepancy between specifications the more stringent one shall be used.

B. Obtain materials from same source throughout. A change in supplier requires resubmittal and approval by the City of Longview.

1.7 REGULATORY REQUIREMENTS

A. Conform to TxDOT Item 360 for concrete pavement, Item 529 for curb and gutter, and other applicable TxDOT specifications as related to concrete roads and parking.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not place concrete when base surface temperature is less than 40 degrees F, or surface is wet or frozen.

PART 2 PRODUCTS

2.1 FORM MATERIALS

A. Form Materials: Conform to ACI 301, TxDOT Item 360.4.7 and 420.9, and City of Longview standards.

2.2 REINFORCEMENT

A. Reinforcing Steel Bar and Wire Fabric: Type specified in City of Longview standards and TxDOT Item 440 and 360.

2.3 CONCRETE MATERIALS

A. Concrete Materials: As specified in City of Longview standards, TxDOT Items 300, 360, 420, 421, 433, 437, 440, and 526.

B. Concrete mix design shall not include flyash or other replacements for cement unless approved by the City of Longview.

2.4 CONCRETE MIX - BY PERFORMANCE CRITERIA

A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.

B. Select proportions for normal weight concrete in accordance with ACI 301 Method 1.

C. Use accelerating admixtures in cold weather only when approved by City of Longview. Use of admixtures will not relax cold weather placement requirements.

D. Use calcium chloride only when approved by City of Longview.

E. Use set retarding admixtures during hot weather only when approved by City of Longview.

2.5 SOURCE QUALITY CONTROL AND TESTS

A. Section 01400 - Quality Control: Provide mix design for City of Longview’s approval.

B. Submit proposed mix design of each class of concrete to appointed firm for review prior to commencement of Work.

C. Tests on cement and aggregates will be performed to ensure conformance with specified requirements.

D. Test samples in accordance with ACI 301.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify compacted lime stabilized subgrade is acceptable and ready to support paving and imposed loads.

B. Verify gradients and elevations of base are correct.

3.2 SUB-BASE

A. Sub-base shall be eight (8) inches of mechanically reworked and compacted soils. The top 8 inches shall be lime treated as described in the City of Longview standards.

3.3 PREPARATION

A. Moisten base to minimize absorption of water from fresh concrete.

B. Coat surfaces of manhole, catch basin, and frames with oil to prevent bond with concrete pavement.

C. Notify City of Longview minimum 24 hours prior to commencement of concreting operations.

3.4 FORMING

A. Place and secure forms to correct location, dimension, profile, and gradient.

B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.

C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

D. Form work should be done in accordance with TxDOT Items 360 and 420.

3.5 REINFORCEMENT

A. Place reinforcement as indicated in Plans.

B. Interrupt reinforcement at joints as shown on the Plans.

C. Place dowels and reinforcement to achieve pavement and curb alignment as detailed. Dowels shall be placed straight and level.

D. Provide doweled joints 18 inches on center at transverse joints and interruptions of concrete, with one end of dowel set in capped sleeve to allow longitudinal movement

E. Reinforcement should be done in accordance with TxDOT Items 360.7 and 440.

3.6 PLACING CONCRETE

A. Place concrete in accordance with ACI 301 and as specified in City of Longview standards and TxDOT Item 360.

B. Ensure reinforcement, inserts, embedded parts, formed joints are not disturbed during concrete placement.

C. Place concrete continuously over the full width of the panel and between predetermined construction joints.

3.7 JOINTS

A. Place expansion and contraction joints as shown in the Plans. Align curb, gutter, and sidewalk joints.

B. Place joint filler between paving components and building or other appurtenances. Recess top of filler ¼ inch for sealant placement.

C. Provide scored joints at 4-foot intervals, between sidewalks and curbs, and between curbs and pavement.

D. Provide keyed joints as indicated.

3.8 FINISHING

A. Roadway Paving: The surface shall be tined and carpet dragged as per TxDOT Item 360 unless otherwise approved by the City of Longview.

B. Sidewalk Paving: Light broom.

C. Curbs and Gutters: Light broom.

D. Direction of Texturing: Perpendicular to pavement direction.

E. Inclined Vehicular Ramps: Broomed perpendicular to slope.

F. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.9 JOINT SEALING

A. Separate pavement from vertical surfaces with ½ inch thick joint filler.

B. Place joint filler in pavement pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

C. Extend joint filler from bottom of pavement to within ½ inch of finished surface. Complete joint with concrete joint sealer.

3.10 TOLERANCES

A. Maximum Variation of Surface Flatness: ¼ inch in 10 feet.

B. Maximum Variation From True Position: ¼ inch.

3.11 FIELD QUALITY CONTROL

A. Testing firm will take cylinders and perform slump and air entrainment tests in accordance with ACI 301.

B. Three concrete test cylinders will be taken for every 100 cu yd or less of each class of concrete placed each day.

C. One additional test cylinder will be taken during cold weather and cured on site under same conditions as concrete it represents.

D. One slump test will be taken for each set of test cylinders taken.

E. Maintain records of placed concrete items. Record date, location of pour, quantity, air temperature, and test samples taken.

3.12 PROTECTION

A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury. Concrete shall be cured in accordance with TxDOT Item 360.11 and 360.12.

B. Do not permit pedestrian or vehicular traffic over pavement for 7 days minimum after finishing.

END OF SECTION

SECTION 02525 - RIDE QUALITY AND PAVEMENT ACCEPTANCE

PART 1 PART 1 GENERAL

1.1 SECTION INCLUDES

A. Measure and evaluate the ride quality and acceptability of pavement surfaces.

1.2 RELATED SECTIONS

A. Section 01400 - Quality Control

B. Section 02510 – Asphaltic Concrete Paving

C. Section 02520 – Portland Cement Concrete Paving

D. Section 02530 - Concrete Curb and Gutter.

1.3 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges (2014).

1.4 SUBMITTALS

A. Section 01300 – Submittals: Submit results of testing to City of Longview within 24 hours of tests.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Surface Test Type A. Provide a 10-ft. straightedge or where allowed, a high-speed or lightweight inertial profiler, certified at the Texas A&M Transportation Institute.

B. Surface Test Type B. Provide a high-speed or lightweight inertial profiler, certified at the Texas A&M Transportation Institute. Provide equipment certification documentation. Display a current decal on the equipment indicating the certification expiration date.

C. Use a certified profiler operator approved by the City of Longview. When requested, furnish documentation for the person certified to operate the profiler.

D. Diamond Grinding Equipment. Provide self-propelled powered grinding equipment specifically designed to smooth and texture pavements using circular diamond blades when grinding is required. Provide equipment with automatic grade control capable of grinding at least 3 ft. of width longitudinally in each pass without damaging the pavement.

PART 3 EXECUTION

3.1 WORK METHODS

A. Measure and evaluate profiles using Surface Test Types A and B on surfaces as described below unless otherwise required by the City of Longview.

B. Transverse Profile. Measure the transverse profile of the finished riding surface in accordance with Surface Test Type A.

C. Longitudinal Profile. Measure the longitudinal profile of the surface, including horizontal curves.

  1. Travel Lanes. Unless otherwise approved by the City of Longview, use Surface Test Type B on the final riding surface of all travel lanes except as follows:

    a. Service Roads and Ramps. Use Surface Test Type A on service roads and ramps unless Surface Test Type B is required by the City of Longview.

    b. Short Projects. Use Surface Test Type A when project pavement length is less than 2,500 ft. unless otherwise approved by the City of Longview.

    c. Bridge Structures. Measure the profile in accordance with the pertinent item or use Surface Test Type A for span type bridge structures, approach slabs, and the 100 ft. leading into and away from such structures.

    d. Leave-Out Sections. Use Surface Test Type A for leave-out sections and areas between leave-out sections that are less than 100 ft.

    e. Ends. Use Surface Test Type A on the first and last 100 ft. of the project pavement length

  2. Shoulders and Other Areas. Use Surface Test Type A for shoulders and all other areas including intermediate pavement layers.

D. Profile Measurements. Measure the finished surface in accordance with Surface Test Type A or B in accordance with Section 3.1.B, “Transverse Profile,” 3.1.C, “Longitudinal Profile,” or as required by the City of Longview.

  1. Surface Test Type A. Test the surface with a 10-ft. straightedge as directed. Use an inertial profiler to measure the surface when allowed. The City of Longview will evaluate the results of the surface testing.

  2. Surface Test Type B.

    a. QC Testing. Perform QC tests on a daily basis throughout the duration of the project. Use a 10-ft. straightedge, inertial profiler, profilograph, or any other means to perform QC tests.

    b. QA Testing. Perform QA tests using either a high-speed or lightweight inertial profiler. Coordinate with and obtain authorization from the City of Longview before starting QA testing. Perform QA tests on the finished surface of the completed project or at the completion of a major stage of construction, as approved. Perform QA tests within 7 days after receiving authorization.

c. The City of Longview may require QA testing to be performed at times of off-peak traffic flow. Operate the inertial profiler in a manner that does not unduly disrupt traffic flow as directed. When using a lightweight inertial profiler to measure a surface that is open to traffic, use a moving traffic control plan in accordance with Part 6 of the TMUTCD and as approved by the City of Longview.

d. In accordance with Tex-1001-S, operate the inertial profiler and deliver test results within 24 hr. of testing. Provide all profile measurements in electronic data files using the format specified in Tex-1001-S.

e. Verification Testing. The City of Longview may perform ride quality verification testing within 10 working days after the Developer/Contractor’s QA testing is complete for the project or major stage of construction. When the City’s profiler produces an overall average international roughness index (IRI) value over 3.0 in. per mile higher than the value calculated using Developer/Contractor data, the City of Longview will decide whether to accept the Developer/Contractor’s data, use the City’s data, use an average of both parties’ data, or request a referee test. Referee testing is mandatory if the difference is greater than 6.0 in. per mile.

f. Referee Testing. The City of Longview will conduct third party referee testing, and the results are final. The City of Longview may require recertification for the Developer/Contractor’s or City’s inertial profiler.

E. Acceptance. The City of Longview will evaluate profiles for determining acceptance and corrective action.

F. Surface Test Type A. Use diamond grinding or other approved work methods to correct surface areas that have more than 1/8-in. variation between any 2 contacts on a 10-ft. straightedge. For asphalt concrete pavements, fog seal the aggregate exposed from diamond grinding. Following corrective action, retest the area to verify compliance with this Item.

G. Surface Test Type B. The City of Longview will use the QA test results to determine ride quality. IRI values will be calculated using the average of both wheel paths. When taking corrective actions to improve a deficient 0.1-mi. section, acceptance will be based on the data obtained from reprofiling the corrected area.

H. Any 0.1-mi. section that contains localized roughness shall not be accepted.

I. IRI Deficient 0.1-mi. Sections - When any 0.1-mi. section has an average IRI over 95.0 in. per mile, correct the deficient section to an IRI of 75 in. per mile or less. After making corrections, reprofile the pavement section to verify that corrections have produced the required improvements.

J. Corrective Action. Use diamond grinding or other approved work methods to correct any deficient 0.1-mi. section. For asphalt concrete pavements, fog seal the aggregate exposed from diamond grinding or other approved work methods allowed.

K. The pavement will be acceptable when successful corrective action improves the IRI of a deficient 0.1-mi. section and the pave is approved by the City of Longview.

L. If corrective action does not produce the required improvement, the City of Longview may require:

    1. continued corrective action, or

    2. removal and replacement with new pavement.

3.2 Localized Roughness. Measure localized roughness using an inertial profiler in accordance with Tex-1001-S. The City of Longview will determine areas of localized roughness using the individual profile from each wheel path.

A. Use a 10-ft. straightedge, when allowed, to locate areas that have more than 1/8-in. variation between any 2 contacts on the straightedge.

B. The City of Longview may waive localized roughness requirements for deficiencies resulting from manholes or other similar appurtenances near the wheel paths.

C. Corrective Action. Use diamond grinding or other approved work methods to correct localized roughness. For asphalt concrete pavements, fog seal the aggregate exposed from diamond grinding or other approved work methods allowed.

D. Reprofile the corrected area, and provide results that show the corrective action was successful.

E. If the corrective action is not successful, the City of Longview will require continued corrective action or removal and replacement of the pavement.

END OF SECTION

SECTION 02530 - CONCRETE CURB AND GUTTER

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Concrete curb and gutter

1.2 RELATED SECTIONS

A. Section 01400 – Quality Control

B. Section 03300 – Cast-In-Place Concrete

1.3 REFERENCES

A. Texas Department of Transportation Standard Specifications for Construction of Highways, Streets, and Bridges, 2014 or latest edition.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals

B. Product Data: Provide data on concrete mix design, joint filler, admixtures, and curing compounds.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with TxDOT Item 529.

PART 2 PRODUCTS

2.1 CONCRETE

A. Concrete shall be Portland Cement Concrete as described in the City of Longview standards.

B. Concrete mix design shall not include fly ash or other replacement material for cement.

2.2 REINFORCING STEEL

A. All reinforcing steel shall conform to the requirements of TxDOT.

B. All steel reinforcement shall be accurately placed as shown on the Plans and held in place during progress of concreting by such effective means that it shall not be moved out of true position.

C. All bars shall be wired at their intersections and at all laps or splices. All bars at splices shall be lapped a minimum of 20 diameters of the bar or 12 in., whichever is greater.

D. All steel must be free from paint, oil, and all loose scale, rust, dirt, and foreign substances shall be completely removed before using.

2.3 EXPANSION JOINTS

A. Expansion joints shall conform to the requirements of TxDOT.

B. Expansion joints shall be constructed of an approved type of expansion joint.

C. Expansion joints shall be placed in the curb and gutter at 40 ft intervals and at intersection returns and other rigid structures.

D. Tooled joints shall be placed at 10 ft. intervals or matching abutting sidewalk joints and pavement joints.

E. Expansion joints shall be laced at all intersections with concrete driveways, curbs, buildings, and other curb and gutters.

F. All expansion joints shall not be less than ½ inch thick, extending the full depth of the concrete and shall be perpendicular and at right angles to the face of the curb.

G. All joints shall be placed in strict alignment with concrete paving joints.

H. All joints through the gutters shall be sealed with silicone sealant unless otherwise specified.

PART 3 EXECUTION

3.1 CONVENTIONALLY FORMED CONCRETE

A. Forms shall be of wood, metal, or other approved material, of a section satisfactory to the City of Longview, straight, free of warp and of the depth required.

B. The forms shall be securely staked to line and grade, and maintained in a true position during the placing of concrete.

C. The concrete shall be placed into the forms and then struck off with a template which is approximately ¼” to ⅜” less than the dimension of the finished curb.

D. After the concrete has been struck off and after it has become sufficiently set, the surface shall be plastered with a mortar consisting of one part of Portland cement and two parts fine aggregate.

E. The mortar shall be applied with a template made to conform to the finished curb dimensions as shown on Plans.

F. Exposed edges shall be rounded by the use of an edging tool to the radius shown on the Plans.

G. All exposed surfaces shall be brushed to a smooth and uniform surface

H. The completed work shall be cured for a period of not less than 72 hours by one of the methods specified in TxDOT Item 420.

3.2 EXTRUDED OR SLIPFORMED CONCRETE

A. The concrete shall be placed with self-propelled equipment approved by the City of Longview.

B. The line shall be maintained from a guideline set by the Developer/Contractor based on the alignment data shown on the Plans. The outline shall strictly to the details shown on the Plans.

C. The forming tube of the extrusion machine or the form of the slipform machine shall be readily adjustable vertically during the forward motion of the machine to provide required variable heights necessary to conform to the established grade line.

D. To provide a continual check on the grade, a pointer or gauge shall be attached to the machine in such a manner that a comparison can be made between the extruded or slipform work and the guideline.

E. Concrete shall be fed into the machine in such a manner and at such consistency that the finished work will present a well-compacted mass with a surface free from voids and honeycomb, and true to the required shape, line and grade.

F. Any additional surface finishing specified and/or required shall be performed immediately after extrusion or slipforming.

G. The completed work shall be cured for a period of not less than 72 hours by one of the methods specified in TxDOT Item 420.

END OF SECTION

SECTION 02580 - PAVEMENT MARKINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Reflectorized Pavement Markings

B. Prefabricated Pavement Markings

C. Raised Pavement Markers

1.2 REFERENCES

A. Texas Department of Transportation – Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition, Item 666 – Reflectorized Pavement Markings.

B. Texas Department of Transportation – Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition, Item 668 – Prefabricated Pavement Markings.

C. Texas Department of Transportation – Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition, Item 672 – Raised Pavement Markers.

D. Texas Department of Transportation – Standard Specifications for Construction of Highways, Streets and Bridges, 2014 Edition, Item 678 – Pavement Surface Preparation For Markings.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets for marking paint.

1.4 PROJECT CONDITIONS

A. Environmental Requirements: Do not apply marking paint when weather is foggy or rainy, or ambient pavement temperatures are below 50° F when measured in accordance with Tex-829-B, nor when such conditions are anticipated in subsequent 8 hours.

B. Protection: Protect adjacent curbs, walks, fences and other items from over spray of marking paint.

PART 2 PRODUCTS

2.1 Pavement Markers:

A. Type I Thermoplastic Traffic Marking Paint in accordance with TxDOT Item 666.

B. DMS-8240 Type C Heated-in-Place Pavement Markers in accordance with TxDOT Item 668.

2.2 EQUIPMENT: Must comply with TxDOT Item 666.3.

PART 3 EXECUTION

3.1 PREPARATION

A. Prepare pavement per TxDOT requirements as outlined in Item 666.4.B.

3.2 APPLICATION

A. Install Type I Thermoplastic Traffic Marking Paint per TxDOT requirements as outlined Item 666.4.C.

B. Install DMS-8240 Type C Pavement Markers per manufacturer's instructions and in accordance with the surface condition, moisture, and temperature requirements as outlined in TxDOT Item 668.

3.3 CLEANING: Remove over spray from surfaces other than those requiring marking paint.

END OF SECTION

SECTION 02581 - SMALL ROADSIDE SIGN ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This Item shall govern the furnishing and installation of small roadside sign assemblies.

1.2 REFERENCES

A. Materials and Construction - Texas Department of Transportation – Standard Specifications for Construction and maintenance of Highways, Streets, and Bridges, 2014 Edition, Item 636 or latest edition.

B. Texas MUTCD – Texas Manual on Uniform Traffic Control Devices, 2014 Revision 2 or latest.

1.3 SUBMITTALS

A. Product Data: Product data sheets for signs, posts, embeds, appurtenances.

B. Sign location Plan showing locations and sign schedule.

C. Sign details including size, images, text, and colors.

1.4 PROJECT CONDITIONS

PART 2 PRODUCTS

2.1 ALUMINUM SIGNS

A. Qualities: Diamond Grade Aluminum Sign.

B. Standards:

1. TxDOT, Item 636 for sign materials and construction
2. Texas MUTCD as referenced by Texas Administrative Code, Title 43, Section 25.1
3. City of Longview for posts, embed, attachment.

PART 3 EXECUTION

3.1 APPLICATION

A. Furnish and install proposed signs per requirements of City of Longview standards with perforated, square, galvanized post embed set in concrete, perforated, square, galvanized post anchored in embed, aluminum sign, and stainless steel nuts, washers, and bolts. Apply markings straight and uniform.

B. Completed signs shall be washed with a biodegradable cleaning solution acceptable to the manufacturer of the sheeting to remove all grease, oil, dirt, smears, streaks, finger marks, and other foreign material prior to final inspection after erection.

END OF SECTION

SECTION 02607 - MANHOLES AND COVERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Modular precast concrete manhole sections with tongue-and-groove joints, covers, anchorage, and accessories.

1.2 REFERENCES

A. ASTM A48 - Gray Iron Castings.

B. ASTM C478 - Precast Reinforced Concrete Manhole Sections.

C. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.

1.3 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Shop Drawings: Indicate manhole locations, elevations, piping, sizes and elevations of penetrations.

C. Product Data: Provide manhole covers, component construction, features, configuration, and dimensions.

1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

PART 2 PRODUCTS

2.1 PRECAST CONCRETE MANHOLE

A. MATERIALS: Manhole Sections: Reinforced precast in accordance with ASTM C478 with gaskets in accordance with ASTM C923.

B. COMPONENTS

1. Lid and Frame:

   a. ASTM A48, Class 30B Cast iron construction, machined flat bearing surface, removable. Provide and install bolted, watertight lid when manholes are located within the 100-year floodplain or at locations required by the City of Longview.

b. Lid design; live load rating of 20,000 psi, sealing gasket, molded with "SANITARY SEWER", or "STORM SEWER" depending the application for the lid.

c. Sanitary Sewer lids shall have a minimum of 30-in diameter opening.

d. Storm Sewer lids shall have a minimum of 24-in diameter opening.

e. The ring and lid shall weigh a minimum of 210 pounds.

f. Manufacturer: East Jordan Iron Works, Inc., Model V-1420/1430 or City of Longview approved equal.

g. Manhole rings and covers shall be watertight when within the 100-yr floodplain.

h. Bitumastic tape continuous at the exterior of the top of the cone to create a watertight seal at manhole ring and grade adjustment ring(s).

2. Base pads shall be precast in accordance with ASTM C478.

3. Bituminous or non-shrink grout forming a watertight seal.

4. Resilient Connectors: A-Lock X-Cel or City of Longview approved equal in accordance with ASTM C-923.

C. CONFIGURATION

1. Shaft Construction:

   a. Concentric with concentric top section as shown on the drawings; lipped male/female joints; sleeved to receive pipe sections.

   b. Joints shall be sealed with compression seal.

   c. Seal shall be Forsheda No. 114 or City of Longview approved equal.

2. Shape: Cylindrical.

3. Clear Inside Dimensions:

   a. Minimum inside diameter of 48 inches for standard manhole sections or as otherwise required.

   b. For manhole section other than standard, the minimum inside diameter shall be as indicated on the Drawings.

4. Design Depth: As indicated.

5. Clear Lid Opening: Minimum 30 inches in diameter sanitary sewer and 24-in for storm sewer or larger as required by the City of Longview.

6. Pipe Entry: Provide openings as indicated or required.

7. Pipe Connections: Resilient connections cast into the wall of the precast base.

8. Manhole Inverts:

   a. Grout inverts after pipes are in place.

   b. Bench sides as required.

   c. Slope for drainage.

   d. Inverts shall meet the requirements of 30 TAC 217.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify items provided by other sections of Work are properly sized and located.

B. Verify that built-in items are in proper location, and ready for roughing into Work.

C. Verify excavation for manholes is correct.

3.2 PREPARATION

A. Coordinate placement of inlet and outlet pipe or duct sleeves required by other sections.

3.3 PLACING MANHOLE SECTIONS

A. Excavate to a uniform depth to permit the installation of a minimum of 12 inches of gravel material for base pad subgrade.

B. Adjust elevation of gravel material as required to attain proper grade and alignment of the base section.

C. Place base pad, set top surface level. Place manhole in accordance with manufacturer's recommendations.

D. Place manhole sections plumb and level, trim to correct elevations, anchor to base pad.

E. Cutouts in the bottom sections shall be appropriate for the pipe being laid and shall have identifying markings to facilitate their being used in the correct locations.

F. The connecting pipe for concrete manhole installation with resilient connectors shall be plain end, square cut, spigots, which shall not protrude more than one inch inside the manhole.

G. Stubs for future connections shall be provided at locations shown. Stubs shall be a minimum of one pipe joint long (13 feet) and terminate in a bell with a plug at the distal end.

H. Grout base of shaft sections to achieve slope to exit piping. Trowel smooth. Contour as required.

I. Set cover frames and covers level without tipping, to correct elevations.

J. Coordinate with other sections of work to provide correct size, shape, and location.

K. Manhole height shall be adjusted by using variable height risers set at the lowest section below natural grade.

3.4 INVERTS

A. The bottom of each manhole shall be provided with a "U" shaped channel that is a smooth continuation of the inlet and outlet pipes. In manholes with pipes of different sizes, the tops of the pipes shall be placed at the same elevation, unless otherwise shown on the drawings, and flow channels in the invert sloped on an even slope from pipe to pipe.

B. The surface of the concrete slab shaped to form the invert shall be sloped upward from the edge of the invert to the manhole wall.

1. The upper half of any pipe extending inside the manhole shall be cut substantially flush with the wall.

2. Any rough edge shall be smoothed with mortar.

C. Mortar used in manholes shall be mixed in the proportions by volume of 1 part cement to 4 parts sand. Mortar shall have a workable consistency, but shall be as dry as feasible.

D. The centerline projection of all pipes shall pass through the centerline of the manhole.

3.5 CONNECTION TO EXISTING MANHOLES

A. Connection to existing manholes shall not be made until all downstream manholes and sewer lines have been completed, cleaned, tested, and inspected in accordance with the Specification. The City of Longview must grant approval prior to connection to existing manholes.

B. Connections to existing manholes shall be made by cutting a hole in the wall of the existing manhole, shaping the bottom of the manhole to fit the invert of the connections, inserting a length of sewer pipe through the opening and filling around the pipe with cement mortar and troweling the cement mortar inside and outside the manhole to a neat finish.

1. When necessary to satisfactorily perform the work, the flow of sewage shall be blocked at a time of minimum flow.

2. If necessary to prevent flow back up in the line to the extent that the damage would occur, the Developer/Contractor shall maintain the flow level with a trench pump section inserted in the line or in the next upstream manhole.

3. Discharge shall be made into an appropriate manhole downstream of the construction.

4. Connections to manholes, mains, and house services shall be made in a thoroughly workmanlike manner to the satisfaction of the City of Longview.

5. All bypass pumping shall be considered subsidiary to the construction of the connection and shall be provided by the Developer/Contractor at no additional expense to the Owner.

3.6 CONNECTION TO EXISTING GRAVITY SEWER MAINS

A. Connection to existing gravity sewer mains shall not be made until all downstream manhole and sewer lines have been completed, cleaned, tested, and inspected in accordance with the Specifications. The City of Longview must grant approval prior to connection to existing gravity sewer mains.

B. Developer/Contractor shall carefully excavate around existing gravity sewer main and construct manhole base so as not to disrupt service of existing main. Developer/Contractor shall take all precautions and actions necessary to protect existing main.

C. Connections to existing main shall be made by excavating around the main constructing the manhole to fit the existing main and the proposed effluent line.

1. Once the manhole has been properly constructed, cut the existing main, plug the existing main effluent and direct the flow through the new main.

2. When necessary to satisfactorily perform the work, the flow of sewage shall be blocked at a time of minimum flow.

3. If necessary to prevent flow backup in the line to the extent that damage would occur, the Developer/Contractor shall maintain the flow level with a trench pump inserted in the line or the upstream manhole.

4. Discharge shall be made into an appropriate manhole downstream of construction.

5. All bypass pumping shall be considered subsidiary to the construction of connection to existing sewer mains and shall be provided by the Developer/Contractor at no additional expense to the Owner.

3.7 MANHOLES TO BE ABANDONED

A. Manholes indicated on the Plans to be abandoned shall be abandoned in accordance with these Specifications and the details of the Plans.

B. Manholes shall not be abandoned until the new interceptor has been completed, tested, inspected and approved by the City of Longview.

C. The Developer/Contractor shall plug existing influent and effluent mains, fill lower section to 3’ below natural ground with sand, then backfill the remainder of the manhole with accepted trench backfill material.

1. Backfill material shall be placed in 8" lifts and compacted to 90% standard proctor or 95% standard proctor when in a pavement section.

2. The manhole cone and riser shall be removed to an elevation of 3' below natural ground and then properly disposed of off-site.

3.8 MAHHOLE ACCESS

A. Entrance into manholes in excess of four feet deep shall be accomplished by means of a portable ladder.

B. Developer/Contractor shall provide such ladder as necessary during construction.

C. Comply with appropriate OSHA requirements.

3.9 TESTING

A. Manholes shall be tested for leakage separately and independently of the wastewater lines by hydrostatic exfiltration testing, vacuum testing, or other approved method.

B. The maximum leakage for hydrostatic testing shall be 0.025 gallons per foot diameter per foot of manhole depth per hour. Alternate test methods must ensure compliance with the above allowable leakage.

C. Hydrostatic exfiltration testing shall be accomplished by sealing all wastewater lines coming into the manhole with an internal pipe plug.

1. The manhole shall then be filled with water and maintained for at least one hour.

2. For concrete manholes a wetting period of 24 hours may be used prior to testing in order to allow saturation of the concrete.

D. Vacuum testing:

1. Preparation of the Manhole.

   a. All lift holes shall be plugged.

   b. All pipes entering the manhole shall be temporally plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

2. Procedure.

   a. The test head shall be placed at the top of the manhole in accordance with the manufacturer’s recommendations.

b. A vacuum of 10 in. of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 in. of mercury.

c. The manhole shall pass if the time for the vacuum reading to drop from 10 in. of mercury to 9 in. of mercury meets or exceeds the values indicated in Table 1.

d. If the manhole fails the initial test, necessary repairs shall be made by an approved method. The manhole shall then be retested until a satisfactory test is obtained.

3. Minimum Test Times for Various Diameter Manholes.

	Diameter (in.)		
Depth (ft.)	48 Time (sec.)	60	72
8	20	26	33
10	25	33	41
12	30	39	49
14	35	46	57
16	40	52	67
18	45	59	73
20	50	65	81
22	55	72	89
24	59	78	97

4. For manholes less than 8 ft. in depth, the minimum value listed shall be used. For other manhole diameters or greater depths, refer to ASTM C1244.

E. If a manhole fails a leakage test, the manhole must be made watertight and retested at the Developer/Contractor’s expense.

F. Testing must meet the requirements of 30 TAC 217.58.

END OF SECTION

SECTION 02665 - WATER SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe and fittings for water lines including supply lines and potable water distribution lines.

B. Fire hydrants, fittings, and appurtenances.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals.

B. Section 01400 – Quality Control.

D. Section 02205 – Soil Materials.

E. Section 02207 – Aggregate Materials.

F. Section 02225 – Excavation, Backfill, and Compaction for Utilities.

G. Section 02314 – Pipeline Crossing Highways, Streets, and Railroads by Boring or Open Cut

H. Section 02675 – Disinfection of Water Distribution Systems.

1.3 REFERENCES

A. American Society for Testing and Materials (ASTM)

1. ASTM A126 – Gray Iron Castings for Valves, Flanges and Pipe Fittings.
2. ASTM A307 – Specification for Carbon Steel Bolts and Studs 60,000 psi Tensile.
3. ASTM A536 – Ductile Iron Castings.
4. ASTM B88 – Seamless Copper Water Tube.
5. ASTM D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort.
6. ASTM D1784 – Standard Specification for Rigid PVC Compounds and Chlorinated PVE Compounds.
7. ASTM D1785 – Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
8. ASTM D2241 – Standard Specifications for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
9. ASTM D2464 – Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.

10. ASTM D2466 – Standard Specifications for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40 (SDR Series).

11. ASTM D2467 – Polyvinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.

12. ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials

13. ASTM D2855 – Making Solvent-Cemented Joints with Polyvinyl Chloride (PVC) Pipe and Fittings.

14. ASTM D2922 – Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

15. ASTM D3017 – Standard Test Methods for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

16. ASTM D3139 – Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.

17. ASTM F477 – Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

18. ASTM D3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Pipe and Tubing

19. ASTM D 3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Materials

B. American Water Works Association (AWWA)

1. AWWA C104 – Cement Mortar Lining for Ductile-Iron Pipe and Fittings

2. AWWA C105 – Polyethylene Encasement for Ductile-Iron Pipe Systems

3. AWWA C110 – Ductile-Iron and Gray-Iron Fittings

4. AWWA C111 – Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

5. AWWA C115 – Flanged Ductile-Iron Pipe with Ductile-Iron or Gray Iron Threaded Flanges

6. AWWA C116 – Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings

7. AWWA C150 – Thickness Design of Ductile-Iron Pipe

8. AWWA C151 – Ductile-Iron Pipe, Centrifugally Cast

9. AWWA C153 – Ductile-Iron Compact Fittings for Water Service

10. AWWA C502 – Dry-Barrel Fire Hydrants

11. AWWA C600 – Installation of Ductile-Iron Water Mains and Their Appurtenances

12. AWWA C605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water

13. AWWA C800 – Underground Service Line Valves and Fittings

14. AWWA C900 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 inches through 12 inches, for Water Transmission and Distribution

15. AWWA C901 – Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, ½ inch through 3 inches for Water Service

16. AWWA C905 – Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 inches through 48 inches, for Water Transmission and Distribution

17. AWWA C906 – Polyethylene (PE) Pressure Pipe and Fitting, 4 inches through 63 inches for Water Distribution and Transmission

18. AWWA C909 – Molecularly Oriented Polyvinyl Chloride (PVCO) Pressure Pipe, 4 inches through 24 inches, For Water Distribution

C. National Sanitation Foundation (NSF)

1. NSF14 – Plastic Piping System Components and Related Materials.

2. NSF61 – Drinking Water System Components – Health Effects.

D. American National Standards Institute (ANSI).

1. ANSI B16.9 – Fittings.

2. ANSI B36.19 – Wall Thickness.

3. ANSI A21.11/AWWA C111 – Mechanical Joints.

4. ANSI B16.1 – Flanges and Flanged Fittings.

E. Texas Administrative Code, Volume 30, Chapter 290, Water Hygiene.

1.4 SUBMITTALS

Submit in accordance with Section 01300 – Submittals.

A. Product data sheets on all materials used in the project.

1.5 QUALITY ASSURANCE

A. Pipeline installation shall be in accordance with manufacturer's recommendations and as supplemented by these specifications.

B. Pipe shall be kept clean of all foreign matter.

C. Jointing shall be by trained employees.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Each load of pipe delivered to the job site shall be inspected by the City of Longview.

B. Pipe transported without adequate protection shall be rejected and removed immediately from the job site.

C. If requested by the City of Longview, randomly selected samples of the pipe shall be forwarded immediately to an approved testing laboratory with instructions to check the pipe for compliance with applicable product standards, ASTM Specifications, and other applicable specifications.

D. If the testing laboratory reports concur that the pipe does not meet specifications, the defective pipe shall be removed immediately from the job site by the Developer/Contractor.

E. If the pipe is defective, all costs for shipping of samples, laboratory testing, removal of defective pipe, and replacement pipe shall be the sole responsibility of the Developer/Contractor. If the pipe is not defective, the Owner shall pay for shipping of samples, laboratory testing, and replacement of samples.

PART 2 PRODUCTS

2.1 PIPE

A. Ductile Iron Water Pipe

1. All ductile iron water pipe shall be in accordance with ANSI/AWWA C150/A21.50 and ANSI/AWWA C151/A21.51.
2. Ductile iron water pipe shall be at least Pressure Class 250.
3. All pipes shall bear the NSF Seal of Approval.
4. Interior surfaces shall be cement lined per AWWA C104.
5. Exterior surfaces shall be coated with bituminous coating per AWWA C110.
6. Pipe shall be free from excessive pits, scars, or other surface defects.
7. Joints shall be integral bell with flexible elastomeric seal per AWWA C111.
8. Install pipe as specified in AWWA C600.
9. All ductile iron pipe, fittings, and appurtenances shall be wrapped in eight mil polyethylene and tape encasement per AWWA C105.
10. Pre-approved Manufacturers
    a. American Cast Iron Pipe Co.

        b. U.S. Pipe.
        c. Griffin.
        d. City of Longview Approved Product List.

B. PVC Water Pipe

    1. AWWA C900 and AWWA C905 pipe four inches and larger in diameter shall be DR 18 pressure class 235.
    2. AWWA C909 pipe shall be pressure class 235.
    3. Pipe less than four inches in diameter shall be Type 1, Grade 1, Polyvinyl Chloride, Schedule 40 pipe conforming to ASTM D1785.
    4. Blue pipe shall be supplied unless otherwise agreed upon at time of purchase.
    5. All pipe shall bear the NSF seal of approval.
    6. For pipe two inches and larger in diameter, the joints shall be integral bell with a flexible elastomeric seal. For pipe smaller than two inches in diameter, joints shall be glued.
    7. Pipe shall be free of excessive pits, scars, or other surface defects
    8. Joints shall be integral bell with flexible elastomeric seal per AWWA standards
    9. Install pipe as specified in AWWA C605
    10. Pre-approved Manufacturers for AWWA C900 and C905 pipe
        a. Certainteed.
        b. Napco.
        c. JM/PW Eagle
        d. Diamond Pipe Co.
        e. Pipelife Jet Stream, Inc.
        f. City of Longview Approved Product List.
    11. Pre-approved Manufacturer for AWWA C909 Pipe
        a. JM/PW Eagle
        b. City of Longview Approved Product List.

C. Restrained Joint PVC Water Pipe

1. Pipe shall be DR 18 pressure class 235.

2. All pipe shall bear the NSF seal of approval.

3. The restrained joint pipe system shall meet all short and long term pressure test requirements of AWWA C900 and C905.

4. Pipe and coupling shall be made from unplasticized PVC compounds having a minimum cell classification of 12454-B as defined in ASTM D1784.

5. The compound shall qualify for a Hydrostatic Design Base of 4000 psi of water at 73.4° F in accordance with the requirements of ASTM D2837.

6. Blue pipe shall be supplied unless otherwise agreed upon at time of purchase.

7. Restrained joint PVC pipe products shall have been tested and approved by an independent third-party laboratory for continuous use at rated pressures.

   a. Copies of agency approval reports or product listing shall be provided to the City of Longview if requested.

   b. Products intended for contact with potable water shall be evaluated, tested, and certified for conformance with NSF Standard 61 or the health effects portion of NSF Standard 14 by an acceptable certifying organization when required by the regulatory authority having jurisdiction.

8. Pipe shall be joined using non-metallic couplings which, together, have been designed as an integral system for maximum reliability and interchangeability.

   a. High-strength flexible thermoplastic splines shall be inserted into mating precision-machined grooves in the pipe and coupling to provide full 360° restraint with evenly distributed loading.

   b. MJ Gland Adapters shall be used to anchor this restrained-joint PVC pipe to ductile iron accessories such as fittings and valves.

   c. Couplings shall be designed for use at the rated pressures of the pipe with which they are utilized and shall incorporate twin elastomeric sealing gaskets meeting the requirements of ASTM F477.

   d. Joints shall be designed to meet the leakage test requirements of ASTM D3139.

9. Install pipe as specified in AWWA C605

10. Pre-approved Manufacturer for Restrained Joint PVC Water Pipe

    a. Certainteed – Certa-Lok.

    b. City of Longview Approved Product List.

2.2 FIRE HYDRANTS

A. Hydrants shall conform to AWWA C502, the following specifications and shall be compression type. Construction of the hydrants shall be in accordance with the following:

1. The minimum working pressure shall be 150 psi.
2. The size of the valve opening shall be a minimum of 5¼ inches.
3. The diameter of the inlet connection shall be six inches.
4. The inlet connection shall be mechanical joint with follower gland, gland bolts, and accessories.
    a. Nozzles shall be 2 – 2½” w/NST Threads & 1 – 4½” pumper w/NST Threads.
    b. Nozzles shall be “threaded” style and not “leaded” style.
5. Finish shall be one coat of primer and two coats of enamel. Hydrant color shall match the Owner’s standard.
6. Hydrant assembly shall include extensions as required to bring the hydrant to the manufacturer’s recommended level above grade.
7. The direction to open shall be counterclockwise.

B. Manufacturer

1. American Flow Control – American Darling B84B
2. Mueller – A–423 Super Centurion.
3. Clow – Medallion.
4. City of Longview Approved Product List.

2.3 FITTINGS

A. Fittings (two inches and larger in diameter)

1. Fittings shall be ductile iron according to AWWA C110 (full body) /AWWA C153 (compact) for fittings 2 inches in diameter and larger.
2. Interior surfaces shall be cement lined in conformance with AWWA C104.
3. Exterior surfaces shall be bituminous coated in accordance with AWWA C110.
4. Fittings shall have mechanical joints with retainer glands and concrete thrust restraint unless otherwise specified or shown.

5. Any of the following are acceptable types and manufacturers of thrust restraining devices for the pipe types listed unless otherwise specified or shown on the plans. The method for thrust restraining all joints shall have a working pressure rating equal to or exceeding the pressure rating of the fitting which it restrains. The use of thrust restraining devices shall be at the direction of the City of Longview.

   a. Multiple Gripping Wedges

      1) Follower glands utilizing multiple gripping wedges shall utilize torque limiting twist off nuts.

      2) Pre-Approved Manufacturer

         (a) For use on ductile iron pipe, AWWA C900 PVC pipe, and C909 PVC pipe - Star Pipe, Smith Blair Cam-lock, Ford Uniflange, and Ebaa Iron Megalug.

   b. Full Circle Gripping Ring

      1) Pre-Approved Manufacturer

         (a) For use on ductile iron pipe, AWWA C900 PVC pipe, and C909 PVC pipe – Midco Perma-Grip by Midland Mfg. Co.

6. Fittings shall be rated for a working pressure of 350 psi.

B. Fittings (smaller than two inches in diameter)

Fittings for pipe smaller than two inches in diameter shall be in accordance with ASTM D2466.

2.4 COUPLINGS

A. Supply couplings with a steel center band, steel gland rings, gaskets, and bolts.

B. Couplings shall be rated for 1.25 times the maximum operating pressure of the line to be connected.

C. All couplings near bends, fittings, or valves shall be restrained with a City of Longview approved mechanical restraint system.

D. Pre-approved Manufacturers

   1. Dresser Industries.

   2. Smith-Blair.

   3. City of Longview Approved Product List.

2.5 BOLTS AND GASKETS

A. Gaskets shall be 1/16-inch cloth insert, red rubber, full face.

B. Bolts shall be in accordance with the following:

   1. Non-Pressure Applications: ASTM A307A with hot dipped galvanized finish

   2. Pressure Applications: ASTM A307B with hot dipped galvanized finish

   3. Submerged/Splashed (Pressure or Non-Pressure): 316 stainless steel

2.6 PIPE SUPPORTS

A. Install adjustable pipe supports manufactured by Grinnell Inc. or City of Longview approved equal as shown on the plans.

2.7 TAPPING SLEEVES

A. Sleeves shall be designed for a working pressure of at least 150 psi and furnished with a brass or stainless steel test plug through the body for hydrostatic pressure testing.

B. The outlet shall conform to ANSI B16.1, Class 125 flanges designed to accept tapping valves.

C. Sleeves shall be designed to properly fit the type and class of pipe on which they will be used. Sleeves may be cast iron, ductile iron, or welded steel.

D. Tapping sleeves, unless otherwise specified, shall be stainless steel or epoxy coated with stainless steel nuts and bolts.

E. Sleeves which are designed in such a manner that the watertight seal around the outlet is achieved by a gasket placed between the sleeve body and the pipe barrel shall be provided with a recess in the sleeve body to accommodate the gasket.

F. Pre-approved Manufacturers

   1. Smith Blair

   2. JCM

   3. Ford

   4. City of Longview Approved Product List.

2.8 SERVICE LINES

A. Water service lines shall be C901 polyethylene (HDPE) with integral tracer wire unless otherwise specified or shown.

B. The water service lines shall be sized to match existing services with a minimum line size of one inch.

C. Pre-approved Manufacturers for HPDE Service Lines

1. Endot Industries – Endotrace
2. City of Longview Approved Product List

D. Service Saddles

1. Service saddles to be installed on lines up to four inches shall be single stainless steel strap with NPT tap. Service saddles to be installed on lines over four inches shall be double stainless steel strap with NPT tap. Saddle body shall be ductile iron with epoxy coating.
2. Pre-approved Manufacturers
    a. Smith Blair.
    b. City of Longview Approved Product List.

E. Pre-approved Manufacturers for Curb Stops

1. Ford.
2. Mueller.
3. A.W. McDonald Mfg. Co.
4. City of Longview Approved Product List.

F. Corporation Stops

1. Corporation stops shall be bronze with tapered plug and flat key operator. Stops shall have iron pipe threads on inlets and outlets.
2. Pre-approved Manufacturers
    a. Ford.
    b. Mueller.
    c. A.W. McDonald Mfg. Co.
    d. City of Longview Approved Product List.

G. Meter Boxes

1. Meter boxes for 1" and 5/8" water meters in driveways, sidewalks, or pavement shall be Hubbell Power Systems, Inc. A221118501050 or City of Longview approved equal. Meter boxes shall be provided with one 2" touch read hole and mouse holes on centered on each end.
2. Meter boxes for 1-1/2" and 2" water meters in driveways, sidewalks, or pavement shall be Hubbell Power Systems, Inc. A281730507050 or City of Longview

approved equal. Meter boxes shall be provided with one 2" touch read hole and mouse holes on centered on each end.

3. Meter boxes outside of driveways, sidewalks, or pavement shall be NDS part number D15AMR2-OLLOC or City of Longview approved equal. Meter boxes shall be provided with mouse holes on centered on each end.

2.10 BACK FLOW PREVENTERS

A. Backflow preventers shall be of the reduced pressure principle type compliant with all provisions of AWWA C511.

2.11 TRACER WIRE FOR PLASTIC PIPE

A. A continuous THHN 14 solid insulated copper wire shall be installed along with all PVC/HDPE water mains/service lines to assist in locating the line following installation.

PART 3 EXECUTION

3.1 PREPARATION

A. Do not lay pipe in water or when trench or weather is unsuitable for work. Keep water out of trench until jointing is complete and bedding and backfill are placed to the top of the pipe. When work is not in progress, close the ends of the pipe and fittings securely so that no trench water, earth, or other substances will enter pipe or fittings.

B. Keep the inside of the pipe free from foreign matter during operations by plugging or other approved method.

C. Place pipe so that the full length of each section rests solidly upon pipe bedding with recesses excavated to accommodate joints. Take up and re-lay pipe when grade or joint is disturbed after laying.

D. Handle pipe and accessories so that pipe placed in the trench is sound and undamaged. Take particular care not to injure pipe coating when applicable.

E. Cut neatly using approved type mechanical cutter without damaging pipe. Use wheel cutters when possible.

F. Install in locations shown using hangers, brackets, supports, etc. at spacings as recommended by the pipe manufacturer.

G. Field cutting of stainless steel pipe will not be allowed.

3.2 PIPE BEDDING AND BACKFILL – SEE SECTION 02225

3.3 PLACING AND LAYING

A. Bury/Bore water lines as shown.

B. Intersecting lines shall be joined by an appropriate fitting.

3.4 JOINTS

A. Install mechanical joints in accordance with the manufacturer's recommendations.

B. Make push-on joints in accordance with the manufacturer's recommendations.

C. Install solvent weld joints in accordance with ASTM D2855.

D. Joint lubricant shall be as recommended by the pipe manufacturer.

E. Install joints in the field by cleaning all joint surfaces and gaskets with soapy water, tighten bolts alternately, evenly and to the specified torques. Extension wrenches shall not be used to secure greater leverage.

F. Anchor tees, bends and plugged, valved or capped ends of pipe with concrete thrust blocks as necessary and as shown. Place blocks so that the pipe and fitting joints will be accessible for inspection and repair.

G. Water lines shall not be laid within nine feet of sanitary sewer lines. When this separation distance can not be achieved, the water and sewer lines shall be made to comply with 30 TAC Chapters 290 and 217.

3.5 TESTING

A. Hydrostatic Testing

1. Perform testing in accordance with AWWA C600/AWWA C605
2. Test pressure shall be 150 psi (1.5 times the working pressure of 100 psi).
3. Pipeline fill rate shall not exceed 1,000 gpm.
4. Hydrostatic test shall be at least 2 hours in duration. During tests, test pressures shall not vary by more than +/- 5 psi (95 to 105 psi)
5. Test pressure shall be maintained within the tolerance by adding makeup water into the pipeline. The amount of makeup water added shall be accurately measured and shall not exceed the testing allowance. No pipe installation will be accepted if the quantity of makeup water is greater than that determined by the testing allowance
6. Testing allowance:

$$L = \frac{S \times D \times \sqrt{P}}{148{,}000}$$

Where:
L = testing allowance (makeup water), in gallons per hour
S = length of pipe tested, in feet
D = nominal diameter of the pipe, in inches
P = average test pressure during hydrostatic test, in psi

END OF SECTION

SECTION 02669 - VALVES AND COUPLINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. This section includes all material, labor and other items necessary to furnish, install, and test, all pipe, pipe supports, anchors, fittings, valves, specials as shown and specified, and the installation of in-line equipment and appurtenances furnished by others, for process piping systems, and plumbing piping systems.

1.2 RELATED SECTIONS

A. Section 01300 – Submittals.

B. Section 01400 – Quality Control.

C. Section 02665 – Water System.

1.3 SUBMITTALS

A. Procedures for Submittals: Section 01300.

B. The Developer/Contractor shall submit shop drawings of all fabricated piping and shall submit shop drawings and/or manufacturer’s literature for all valves, gauges, and miscellaneous appurtenances, for review prior to ordering or installing any item.

C. Product Data: Manufacturer's product data sheets on all materials incorporated into work.

PART 2 PRODUCTS

2.1 COUPLINGS AND FITTINGS

A. Flanges, Gaskets and Bolts:

1. Cast iron flanges shall conform to ANSI B16.1 Class 125 or 250 as required on the Drawings.

2. Flange gaskets shall be full-face type, rubber, suitable for the intended service. Substitution of other gasket materials shall be only with the express written consent of the City of Longview.

    a. Thickness shall be 1/16" for pipe 10" and less and 1/8" for larger pipe.

    b. Flange assembly bolts shall be standard square head carbon steel machine bolts with heavy, hot pressed, hexagon nuts, ANSI B18.2.

    c. Threads shall conform to ANSI B1.1, coarse thread series, Class 2 fit. Bolt length shall be such that after joints are made up the bolt shall protrude through the nut, but not more than ½".

        d. Bolts for use in submerged service shall be galvanized.

        e. All screwed flanges on cast iron pipe shall be refaced, as required, after fabrication to ensure that pipe ends are flush with face of flange.

    3. Forged steel flanges shall conform to ANSI B16.5, R.F.

        a. Flange gaskets shall match raised faces and shall be asbestos composition.

        b. On 3½" flanges and smaller, gaskets shall be $^{1}/_{16}$" thick.

        c. On 4" flanges and larger, gaskets shall be $^{1}/_{8}$" thick.

        d. Flange assembly bolts shall be standard square head carbon steel machine bolts with heavy, hot pressed hexagon nuts, ANSI B18.2.

        e. 150 psi steel flanges may be bolted to cast iron valves, fittings or other parts, having either integral Class 125 cast iron flanges or screwed Class 125 companion flanges.

        f. When such construction is used, the raised face on the steel flange shall be removed.

        g. Where shown on the Drawings, steel flanges shall match the bolt pattern of ANSI B16.1 Class 250.

B. Pipe Threads:

    1. Unless noted otherwise, all pipe threads shall conform in dimensions and limits of size to ANSI B2.1, taper joint thread.

C. Flange Coupling Adapters:

    1. Flanged coupling adapters shall be Clow F-2535, Dresser Style 127 or 128, or equal.

    2. Coupling gaskets shall be as recommended by the coupling manufacturer for the service intended.

D. Compression Fittings:

    1. Compression fittings for copper pipe shall be Dresser Style 88, McDonald, or equal.

E. Joints:

    1. All other joints shall be mechanical type or push-on type.

    2. Lubricant for push-on type shall be that recommended by the manufacturer of the pipe.

F. Flexible Couplings:

1. There shall be installed where shown on the Plans and as required for proper pipe make-up, sleeve-type couplings equal to Style 38 couplings, as manufactured by the Dresser Manufacturing Division of Dresser Industries.

2. They shall be designed to fit accurately, the outside diameters of the pipe to which they are to connect.

3. Gaskets shall be of molded rubber, Dresser Plain, Grade 27 or equal.

4. Couplings shall be furnished complete with bolts, nuts, and gaskets.

5. Middle rings shall be made up without a pipe stop where necessary for pipe installation or future removal of valves and fittings.

6. The ends of pipe and fittings which are to receive sleeve-type couplings shall be dressed for a distance of not less than the length of the middle ring plus the width of one follower ring in order to remove welding beads or any obstruction to free the movement of the middle ring.

7. There shall be harnesses provided on steel pipe where shown on the Plans, or as necessary for restraint.

8. The harnesses shall be designed for the design operating pressure of the pipeline with a safety factory of 2.

9. The harnesses are to be designed in accordance with AWWA Manual M11, Steel Pipe Design and Installation.

2.2 VALVES

A. General

1. A union or flagged connection shall be provided within 2 feet of each threaded end valve unless the valve can be otherwise easily removed from the piping. Unless otherwise indicated, the direction of rotation of the valve operating, wrench nut, shall be to the left (counterclockwise) to open the valve.

2. Wrench nuts shall be provided on all buried valves, on all valves which are to be operated through floor boxes, and where shown. All wrench nuts shall comply with Section 20 of AWWA C-500.

3. For all valves buried at a depth of greater than 3 feet, a pinned extension stem shall be provided to bring the operating nut within 2 feet of the finished elevation.

4. Bolt patterns for the flange connections shall match the pipe either Class 125 or Class 250 as shown on the plans.

B. Buried Valve Boxes & Extension Stems

1. Valves buried in the ground shall be provided with cast iron valve boxes of proper dimensions to fit over the valve bonnets and then extend to such elevation at or slightly above the finished ground line as directed by the City of Longview.

2. Tops shall be complete with covers and shall be adjustable.

3. Valve boxes shall be set vertical and concentric with the valve stem.

4. Any valve box, which has so moved from its original position as to prevent the application of the valve key, shall be satisfactorily reset by the Developer/Contractor at his own expense.

5. A concrete pad 1.5’ x 1.5’ x 4” thick shall be poured around all valve boxes which are not to be located within proposed or existing pavements.

6. Extension stems shall be provided and installed for all valves with 2” square nut operators so that operating nut is within 2’ of the ground surface.

7. Valve boxes shall be the H-10346, 562-A, two-piece, sliding type, 5½" shaft, 24-36" extension, with drop cover marked water as manufactured by the Mueller Co. or City of Longview approved equal.

8. Except as may be otherwise approved by the City of Longview, all gate valves required shall be from one manufacturer and similar types and sizes shall be identical and the parts interchangeable.

C. Gate Valves

1. Gate valves, 2 inches through 12 inches shall be designed for a working pressure 200 psi.

2. Valves shall conform to AWWA C509 R/S “550 Coated Epoxy” with iron bonnet (bronze mounted), non-rising stem resilient seat, two O-ring stem seals and 2" x 2" square operating nut.

3. Valves shall open when the operating nut is turned to the left (counterclockwise).

4. Unless otherwise specified, valves 12 inches in diameter and larger shall be design for horizontal installation with totally enclosed gear cases.

5. Valve ends shall be mechanical joint complete with accessories or as specified.

6. Tapping valves shall conform to above specification except that the connections shall be ANSI B16.1, Class 125 flange on one side (inlet) and mechanical joint on the other (outlet) or as specified.

7. Wedge shall be constructed of ductile iron, fully encapsulated in synthetic rubber except for guide and wedge nut areas.

8. Wedge rubber shall be molded in place and bonded to the ductile iron portion, and shall not be mechanically attached with screws, rivets, or similar fasteners.

9. Valve operator shall be capable of seating and unseating valves and operating through their full stroke against pressures and velocities as shown by conditions on the Plans.

10. Manual operators shall be the worm gear type having permanently grease lubricated totally enclosed gearing with operating nut and gear ratio design to require not more than 40 lbs. pull. Operator shall be provided with adjustable limit stops on the input shaft to the operator. Limit stops on output shaft of operator will not be permitted. Operator shall be designed for direct burial service and valve box shall be provided over operating nut. Extension stem shall be provided to bring operating nut within 2 feet of ground surface.

11. Pre-approved Acceptable Manufacturers

    a. Mueller

    b. American flow control / American Darling

    c. M & H

    d. Clow R/S

    e. City of Longview Approved Product List

D. Tapping Sleeves & Valves

1. Tapping valves, 2 inches through 12 inches shall be designed for a working pressure 200 psi.

2. Valves shall conform to AWWA C509 R/S “550 Coated Epoxy” with iron bonnet (bronze mounted), non-rising stem resilient seat, two O-ring stem seals and 2" x 2" square operating nut.

3. Valves shall open when the operating nut is turned to the left (counterclockwise).

4. Tapping sleeves, unless otherwise specified, shall be epoxy coated, with stainless steel nuts and bolts; or all stainless steel.

5. Unless otherwise specified, valves 12 inches in diameter and larger shall be design for horizontal installation with totally enclosed gear cases.

6. Valve ends shall be mechanical joint complete with accessories or as specified.

7. Tapping valves shall conform to above specification except that the connections shall be ANSI B16.1, Class 125 flange on one side (inlet) and mechanical joint on the other (outlet) or as specified.

8. Wedge shall be constructed of ductile iron, fully encapsulated in synthetic rubber except for guide and wedge nut areas.

9. Wedge rubber shall be molded in place and bonded to the ductile iron portion, and shall not be mechanically attached with screws, rivets, or similar fasteners.

10. Valve operator shall be capable of seating and unseating valves and operating through their full stroke against pressures and velocities as shown by conditions on the Plans.

11. Manual operators shall be the worm gear type having permanently grease lubricated totally enclosed gearing with operating nut and gear ratio design to require not more than 40 lbs. pull. Operator shall be provided with adjustable limit stops on the input shaft to the operator. Limit stops on output shaft of operator will not be permitted. Operator shall be designed for direct burial service and valve box shall be provided over operating nut. Extension stem shall be provided to bring operating nut within 3 feet of ground surface.

12. Pre-approved Acceptable Manufacturers for Tapping Valves
    a. Mueller
    b. American flow control / American Darling
    c. M & H
    d. Clow R/S
    e. City of Longview Approved Products List

13. Pre-approved Acceptable Manufacturers for Tapping Sleeves
    a. Smith Blair
    b. JCM
    c. Ford
    d. City of Longview Approved Products List

E. Detector Check Valves

1. Detector check valves, 4 inches through 10 inches shall be designed for a maximum working pressure 175 psi.

2. Detector check valves shall be install on fire protection or automatic sprinkler systems when connect to potable water supply or as shown in the Plans.

3. Detector check valves shall include a bypass meter.

4. The Valve body shall be formed, welded units, in heavy steel. Valve shall be hydrostatically tested in excess of 700 psi. All valve linkage parts shall be stainless steel. Valves shall be fusion bonded epoxy coated in accordance with AWWA C550.

5. Detector check valves shall have flanged end connections in accordance with ANSI B16.5 Class 125/AWWA C207 unless shown otherwise in the Plans.

6. Detector check valves shall be Ames Fire and Waterworks Series 1000DCVGPM or City of Longview approved equal.

7. Detector check installation include isolation valves that will allow removal of the entire assembly (gate valve on supply and discharge) as well as curb stops on each side of the meter to isolate and replace the meter.

8. Detector check meter shall be installed in plastic meter box in unpaved areas and traffic load rated CDR box in paved areas.

9. Materials shall conform with the City of Longview Approved Product List.

F. Pipe Supports

1. All exposed piping shall be supported in conformance with the pipe support and structural attachment details of this section.

G. Joint Restraint

1. Where thrust rod anchors are shown or specified the Star Joint Restraint System as manufactured by Star National Products of Columbus, Ohio shall be utilized.

2. This system consists of the use of Super Star Tiebolts, Tienuts, Tierods (¾”) and Tiecouplings.

3. The number of stainless steel tie rods required is listed as follows:

Pipe Size (in.)	Number of ¾" Rods Required
6	2
8	2
10	2
12	4
14	4
16	6
18	6
20	8
24	10
30	12

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify building and trench backfilling have been inspected.

B. Verify substrate base has been contoured and compacted.

3.2 SUBSTRATE PREPARATION

A. Eliminate uneven areas and low spots.

B. Remove debris, roots, branches, stones, in excess of 1 inch in size. Remove subsoil contaminated with petroleum products.

C. Scarify surface to depth of 4 inches where topsoil is scheduled. Scarify in areas where equipment used for hauling and spreading topsoil has compacted subsoil.

3.3 PLACING TOPSOIL

A. Place topsoil in areas where seeding, sodding, and planting is required, to thickness as scheduled. Place topsoil during dry weather.

B. Fine grade topsoil to eliminate rough or low areas. Maintain profiles and contour of subgrade.

C. Remove roots, weeds, rocks, and foreign material while spreading.

D. Manually spread topsoil close to plant life, buildings, and structures to prevent damage.

E. Lightly compact placed topsoil.

F. Remove surplus subsoil and topsoil from site.

G. Leave stockpile area and site clean and raked, ready to receive landscaping.

H. If approved by the City of Longview, 1-in stainless steel tie rods can be used as an alternate to ¾-in tie rods to reduce to number of rods required. The total cross sectional area of the 1-in rods shall meet or exceed the total cross sectional area of the ¾-in rods listed in the table.

I. Weld tie rods to casing or attach to other fixed objects as directed by the City of Longview.

END OF SECTION

SECTION 02675 - DISINFECTION OF WATER SYSTEM

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Disinfection of potable water distribution and transmission system.

B. Testing and reporting results.

1.2 RELATED SECTIONS

A. Section 02665 – Water Systems

1.3 REFERENCES

A. AWWA B300 - Standard for Hypochlorites.

B. AWWA C651 - Standards for Disinfecting Water Mains.

1.4 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.

B. Test Reports: Submit all test reports and indicate results comparative to specified requirements.

C. Certificate: Certify that cleanliness of water distribution system meets or exceeds Texas Department of Health requirements.

1.5 PROJECT RECORD DOCUMENTS

A. Submit under provisions of Section 01700.

B. Disinfection report:

1. Type and form of disinfectant used.
2. Date and time of disinfectant injection start and time of completion.
3. Test locations.
4. Initial and 24 hour disinfectant residuals (quantity in treated water) in ppm for each outlet tested.
5. Date and time of flushing start and completion.
6. Disinfectant residual after flushing in ppm for each outlet tested.

C. Bacteriological report:

1. Date issued, project name, and testing laboratory name, address, and telephone number.
2. Time and date of water sample collection.
3. Name of person collecting samples.
4. Test locations.
5. Initial and 24 hour disinfectant residuals in ppm for each outlet tested.
6. Coliform bacteria test results for each outlet tested.
7. Certification that water conforms, or fails to conform, to bacterial standards of Texas Department of Health.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with the latest version of AWWA C651.

B. Water Treatment Firm: Company specializing in disinfecting potable water systems specified in this Section with minimum three (3) years documented experience.

C. Testing Firm: Company specializing in testing potable water systems, certified by the State of Texas.

D. Submit bacteriologist's signature and authority associated with testing.

1.7 REGULATORY REQUIREMENTS

A. Conform to requirements of the latest version of AWWA C651 for performing the work of this Section.

B. Provide certificate of compliance from Texas Department of Health indicating approval of water system.

PART 2 PRODUCTS

2.1 DISINFECTION CHEMICALS

A. Chemicals: AWWA B300, Hypochlorite.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that piping system has been cleaned, inspected, and pressure tested.

B. Perform scheduling and disinfecting activity with start-up, testing, adjusting and balancing, demonstration procedures, including coordination with related systems.

3.2 EXECUTION

A. Provide and attach required equipment to perform the work of this Section.

B. Introduce treatment into piping system.

C. Maintain disinfectant in system for 24 hours.

D. Flush, circulate, and clean until required cleanliness is achieved; use municipal domestic water.

E. Replace permanent system devices removed for disinfection.

F. Pressure test system to 150 psi. Repair leaks and re-test.

3.3 FIELD QUALITY CONTROL

A. Section 01400 - Quality Assurance: Field inspection and testing.

B. Test samples in accordance with the latest version of AWWA C651.

END OF SECTION

SECTION 02722 - STORM DRAINAGE SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Site storm sewerage drainage piping, fittings and accessories, and bedding.

B. Inlets, junction boxes, cleanouts, and site surface drainage.

C. Culverts, headwalls, safety end treatments.

1.2 RELATED SECTIONS

A. Section 02205 – Soil Materials.

B. Section 02207 – Aggregate Materials.

C. Section 02224 – Excavation, Backfilling, and Compacting for Structures.

D. Section 02607 - Manholes and Covers.

1.3 REFERENCES

A. ASTM C76 - Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.

B. ASTM C443 - Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets.

C. ASTM D698 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures.

D. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

E. ASTM D3017 - Test Methods for Moisture Content of Soil and Soil-Aggregate Mixtures.

1.4 SUBMITTALS FOR REVIEW

A. Section 01300 - Submittals: Procedures for submittals.

B. Product Data: Provide data indicating pipe, and pipe accessories.

1.5 SUBMITTALS FOR INFORMATION

A. Section 01300 - Submittals: Procedures for submittals.

B. Manufacturer's Installation Instructions: Indicate special procedures required to install Products specified.

PART 2 PRODUCTS

2.1 STORM SEWER PIPE MATERIALS

A. All storm sewer pipe shall be RCP unless otherwise approved by the City of Longview.

B. Reinforced Concrete Pipe (RCP): ASTM C76, Class IV with Wall Type C; bar reinforcement; inside nominal diameter of as shown on the Plans.

C. All pipe shall be machine-made by a process, which shall provide for uniform placement of zero slump concrete in the form and compaction by mechanical devices, which shall assure a dense concrete in the finished pavement.

D. Reinforced Concrete Pipe Joint Device: ASTM C443, rubber compression gasket joint. Joints shall be made with Forsheda pre-lubricated gaskets.

E. Concrete Cylinder Pipe (CCP): AWWA C303 Bar Wrapped Concrete Cylinder Pipe; pressure class 50; nominal inside diameter as shown on the Plans.

2.2 PRECAST BOX CULVERT MATERIALS

A. Precast Reinforced Concrete Box Culverts: ASTM C789 or ASTM C8506 as shown on the Plans.

B. All box culverts shall be machine-made by a process, which shall provide for uniform placement of zero slump concrete in the form and compaction by mechanical devices, which shall assure a dense concrete in the finished pavement.

C. Precast Reinforced Concrete Box Culvert Joint Device: ASTM C443, rubber compression gasket joint. Joints shall be made with Forsheda pre-lubricated gaskets.

2.3 ACCESSORIES

A. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

B. Filter Fabric: Non-biodegradable, non-woven, manufactured by Mirafi.

2.4 INLETS

A. All concrete shall have a compressive strength of 3,500 psi @ 28 days

1. Submit mix design for City of Longview approval.

B. Reinforcement shall be deformed, Grade 60 steel and shall be continuous through all joints and corners. Reinforcing bars shall lap a minimum of 36 bar diameters and shall be tied securely with steel wire ties. .

C. Ring and Cover: Cast iron construction, removable, watertight, minimum 210 lbs. as listed on the City of Longview Approved Products List.

1. Cover Design: Machined flat bearing surface.

2. Nominal Ring and Cover Size: 30 inches

3. Manhole must have “STORM SEWER” printed on cover.

2.5 BEDDING AND COVER MATERIALS

A. Bedding: Fill Type A2 as specified in Section 02207.

B. Select Fill: Fill Type S3, as specified in Section 02205.

C. Cover: Fill Type S2, as specified in Section 02205

2.6 CULVERTS, HEADWALLS, SAFETY END TREATMENTS

A. All culverts shall be reinforced concrete pipe unless otherwise approved by the City of Longview.

B. Headwall material and construction shall be cast in place in accordance with TxDOT Item 466 with dimensions and reinforcement per TxDOT Bridge Standards for Culverts and Drainage or otherwise approved by the City of Longview.

C. Safety End Treatments shall be precast meeting the materials and construction requirements of TxDOT Item 467 with dimensions and reinforcement per TxDOT Bridge Standards for Culverts and Drainage or as otherwise approved by the City of Longview.

PART 3 EXECUTION

3.1 EXAMINATION: Verify that trench cut is ready to receive work and excavations, dimensions, and elevations are as indicated on Plans.

3.2 PREPARATION

A. Hand trim excavations to required elevations. Correct over excavation with fine aggregate.

B. Remove large stones or other hard matter, which could damage piping or impede consistent backfilling or compaction.

3.3 BEDDING

A. Excavate pipe trench in accordance with Section 02224 for work of this section.

B. Hand trim excavation for accurate placement of pipe to elevations indicated.

3.4 INSTALLATION - PIPE

A. Install pipe, fittings, and accessories in accordance with ASTM C12, ASTM D2321, and Manufacturer's instructions.

B. Seal joints watertight, and wrap all joints with Dupont Typar filter fabric a minimum of 24 inches around the pipe and shall be 18 inches wide.

C. Embankment and backfill shall be in accordance with Section 02224 for work of this section.

D. Lay pipe to slope gradients noted on Plans with maximum variation from true slope of 1/8 inch in 10 feet.

E. Do not displace or damage pipe when compacting.

F. Refer to Section 02607 for manhole requirements.

G. Concrete Cylinder Pipe shall be used at locations designated on the Plans. The CCP shall span between junction boxes on each side of the telecommunication duct bank with no pipe joints between the proposed junction boxes.

3.5 INSTALLATION – PRECAST BOX CULVERTS

A. Install a concrete mud slab prior to the placement of the box culvert as shown on the plans.

B. Install box culverts, fittings, and accessories in accordance with ASTM C12, ASTM D2321, and Manufacturer's instructions. Seal joints watertight.

C. Lay pipe to slope gradients noted on Plans with maximum variation from true slope of 1/8 inch in 10 feet.

D. Install Type A2 aggregate at sides up to haunch. Provide top cover Type A5 to minimum compacted thickness of 12 inches, compact to 95 percent.

E. Refer to Section 02225 for requirements. Do not displace or damage pipe when compacting.

F. Refer to Section 02607 for manhole requirements.

3.6 INSTALLATION – CLEANOUTS, JUNCTION BOXES, AND INLETS

A. Excavate to a uniform depth to permit the installation of a minimum of 12 inches of gravel material for base pad subgrade. Adjust as required to attain proper grade and alignment of the base section.

B. Place base pad, set to surface level.

C. Place boxes and cleanouts plumb and level, trim to correct elevation, anchor to base pad.

D. Cutouts in the bottom sections shall be appropriate for the pipe being laid and shall have identifying markings to facilitate their being used in the correct locations

E. Natural or artificial “O” ring rubber gaskets shall be used in joints.

F. Mount ring and cover level in grout, secured to top section to elevation indicated.

3.7 FIELD QUALITY CONTROL

A. Request inspection prior to and immediately after placing aggregate cover over pipe.

B. Compaction testing will be performed in accordance with ASTM D698, AASHTO T180, ASTM D2922, ASTM D3017.

C. If tests indicate Work does not meet specified requirements, remove Work, replace and retest.

D. Frequency of Tests: As required by the City of Longview.

E. Infiltration Test: As determined by a hydrostatic head test, shall not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of two feet above the crown of the pipe at the upstream manhole, or at least two feet above existing groundwater level, whichever is greater.

F. Deflection Test: Do not exceed Manufacturer’s recommendation.

G. Pressure Test: Test in accordance with ASTM C828, ASTM C-924, and ASTM F1417.

END OF SECTION

SECTION 02731 - SMALL DIAMETER SANITARY SEWER SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sanitary sewer lines including, blocking, joints, fittings, and other appurtenances for sewer lines 18 inches in diameter or less.

1.2 REFERENCES

A. ANSI/AWWA C104/A21.4 - Cement Mortar Lining for Ductile Iron and Gray Iron Pipe and Fittings for Water.

B. ANSI/AWWA C110/A21.10 - Ductile Iron and Gray Iron Fittings 3 inch through 48 inch, for Water and Other Liquids.

C. ANSI/AWWA C111/A21.11 - Rubber Gasket Joints for Ductile Iron and Gray Iron Pressure Pipe and Fittings.

D. ANSI/AWWA C150/A21.50 - Thickness Design of Ductile Iron Pipe.

E. ANSI/AWWA C151/A21.51. - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand Lined Molds, for Water and Other Liquids.

F. ANSI/AWWA C153/A21.53 - Ductile Iron Compact Fittings for 3 inch through 16 inch for Water and Other Liquids.

G. ASTM A746 - Ductile Iron Gravity Sewer Pipe.

H. ASTM D-3034 – Pipe Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe

I. ASTM D-3212 – Joints for Drain and Sewer Plastic Pipes Using Elastomeric Seals

J. ASTM F-477 – Elastomeric Seals (Gaskets)_ for Joining Plastic Pipe

K. ASTM D-1784 – Rigid Poly (Vinyl Chloride) (PVC) Compounds

L. ASTM D-2412 – Standard Test Method for Determination of External Loading of Plastic Pipe by Parallel Plate Loading

M. ASTM D-2231 – Underground Installation of Thermoplastic Pipe for Sewer and Other Gravity-Flow Applications

1.3 SUBMITTALS

A. Section 01300 - Procedures for Submittals.

B. Product Data: Manufacturer's product data sheets on all materials incorporated into Work.

C. Quality Control Submittals: For information only.

   1. Certificates: Manufacturer's certificates attesting compliance with applicable specifications for grades, types, classes, and other properties.

1.4 QUALITY ASSURANCE

A. Pipeline installation shall be in accordance with manufacturer's recommendations.

B. Pipe shall be kept clean of all foreign matter.

   1. At termination of pipe laying, provide suitable cover to close open end until burying operations are resumed.

1.5 DELIVERY, STORAGE AND HANDLING

A. Each load of pipe delivered to the job site shall be inspected by the Resident Project Representative.

B. Pipe shall be transported with ends covered to prevent debris accumulation during transport.

1.6 PRODUCT CONDITIONS

A. Perform no pipe work in fill areas until embankment or fill has been completed to at least two (2) feet above top of pipe and properly compacted.

PART 2 PRODUCTS

2.1 GRAVITY SYSTEMS

A. Pipe:

   1. Polyvinyl Chloride Pipe (PVC)

      a. PVC pipe shall be in accordance with ASTM D-3034 with integral wall ball and spigot joints.

      b. PVC pipe shall be manufactured from clean, virgin, NSF approved PVC compound meeting the requirements of Cell Class 12454-B as defined by STM D-1784.

      c. Pipes shall be produced with a wall thickness corresponding to dimension ratio SDR-26, with a pipe stiffness value of 115 psi when tested in accordance with ASTM D-2412.

   2. Ductile Iron (DI) Pipe:

      a. Ductile Iron Pipe shall be in accordance with ANSI/AWWA C151/A21.51 with thickness as determined by ANSI/AWWA C150/A21.50.

    b. All Ductile Iron Pipe shall be (Protecto 401) per ANSI/AWWA C104/A21.4 and have a bituminous coated exterior according to ANSI/AWWA C151/A21.51 or C115/A21.15.

    c. Pressure Class 150 shall be used unless otherwise noted.

    d. Ductile Iron Pipe as manufactured by American Cast Iron Pipe or U.S. Pipe shall be used. No other suppliers shall be accepted.

B. Joints:

1. Joints shall be mechanical joint or push-on joint conforming to AWWA C111.

    a. Joint material for Ductile Iron Pipe shall be rubber gasket type conforming to ANSI/AWWA C111/A21.11.

    b. The gaskets shall be furnished by the pipe manufacturer.

2. Each mechanical joint shall consist of a bell cast integrally with the pipe or fitting and provided with an exterior flange having bolt holes and a socket with annular recesses for the sealing gasket and the plain end of the pipe or fitting; a pipe or plain end; a sealing gasket; a follower gland with bolt holes; and tee-head bolts and hexagonal nuts. The mechanical joint shall meet the requirements of ANSI/AWWA C111/A21.11-85.

3. Push-on (bell and spigot) joints shall consist of a bell cast integrally with the pipe or fitting and a socket with annular recesses for the sealing gasket and the plain end of the pipe or fitting.

    a. The push-on joints shall meet the requirements of ANSI/AWWA C111/A21.11-85.

    b. Joints for PVC pipe shall conform to ASTM D-3212 with elastomeric seals conforming to ASTM F-477.

4. All piping shall be push-on, unless otherwise required in the standard details or as required by the City of Longview.

C. Fittings:

1. Standard Fittings: All bends, tees, plugs, adapters, wyes, and other fittings shall meet the requirements of the type and kind of pipe used.

2. Adapters:

    a. When joining dissimilar pipe materials or repairing pipe, suitable adapters shall be used.

    b. The adapters shall be insert or bonded coupling type and shall meet strength and chemical requirements of ASTM C594.

3. Ductile Iron:

    a. Fittings shall be push-on type meeting ANSI/AWWA C110/A21.10.

    b. Fittings shall be cement lined in accordance with ANSI/AWWA C104/A21.4 and shall have a bituminous coated exterior per ANSI/AWWA C110/A21.10 or C153/A21.53.

2.2 ACCESSORIES

A. Non-shrink grout:

    1. Gifford-Hill - Supreme.

    2. L&M – Crystex.

    3. Master Builders – Masterflow 713 Grout.

    4. Sauereisen Cements – F0100 Level Fill Grout.

    5. City of Longview Approved Products List

B. Waterstops:

    1. Waterstops shall be as recommended by pipe manufacturer and approved by the City of Longview.

C. Polyethylene Encasement:

    1. When ductile iron pipe is installed, the entire length of the D.I.P. with the exception of bore encasement shall be encased with polyethylene.

    2. D.I.P. shall be encased with 8-mil thick polyethylene in accordance with ANSI/AWWA C104/A21.5 standard.

PART 3 EXECUTION

3.1 PREPARATION

A. Stake locations of fittings, valves and accessories prior to installation for review by City of Longview.

B. Prior to installation, remove foreign matter from within pipes and fittings and verify material is in satisfactory condition.

C. Trench sufficiently ahead of pipe installation to uncover any potential conflicts with grade.

D. Each joint shall be carefully inspected before being placed in the trench. Any joint found to be cracked or otherwise damaged as to impair its usefulness shall be plainly marked then removed from the site as soon as possible.

3.2 PIPE INSTALLATION

A. Pipe shall be installed in accordance with ASTM D2321/ASTM D2231.

B. Preparation:

   1. Do not lay pipe in water, or when trench or weather are unsuitable for work.

      a. Keep water out of trench until jointing is complete and bedding is placed to top of pipe.

      b. When work is not in progress, close ends of pipe and fittings securely so that no trench water, earth or other substances will enter pipes or fittings.

   2. Keep inside of pipe free from foreign matter during operations by plugging or other City of Longview approved method.

   3. Place pipe so that full length of each section rests solidly upon pipe bed, with recesses excavated to accommodate bells and joints. Take up and relay pipe when grade or joint is disturbed after laying.

   4. Handle pipe and accessories so that pipe placed in trench is sound and undamaged. Take particular care not to injure pipe coating when applicable.

   5. Cut neatly, using approved type mechanical cutter without damaging pipe. Use wheel cutters when practicable.

C. Excavation, Compaction and Backfill: In accordance with Section 02225, Excavating, Backfilling and Compacting for Utilities.

D. Bedding: In accordance with Section 02225 and as shown on the Drawings.

E. Placing and Laying:

   1. Set and bury lines accurately to grades as shown on the plans.

   2. Do not exceed 75 percent of pipe manufacturer's recommendations for deflections from straight line or grade as required by vertical curves, horizontal curves, or offsets. If alignment requires deflections in excess of these limitations, use fittings.

   3. Intersecting lines shall be joined by an appropriate fitting.

   4. Any adjustment to obtain correct line shall be made by tamping or removing soil and in no case by wedging or blocking pipe.

   5. Pipe shall be secured against upheaval or floating during the placement of concrete bedding, encasement, or anchors.

F. Joints:

1. Make push-on joints in accordance with manufacturer's recommendations. Lay spigot ends downstream and push-on to full depth.

2. Spigot and bells shall be cleaned thoroughly before the application of lubricant and attachment of the preformed joint gasket.

G. Connections to Existing Sewers:

1. Connections to existing sewers shall not be made until all of the proposed sewer lines and manholes have been constructed, cleaned and approval granted by the City of Longview for making connection.

2. No connection shall be made until all new sewers have passed specified leakage tests.

3.3 REMOVAL AND REPLACEMENT OF PIPE IN ORIGINAL LOCATION

A. Preparation

1. Carefully remove or protect surface features in work area. Excavate to completely expose the existing pipe, taking adequate precautions not be disturb any other existing underground facilities and handling excavated materials as described in other Sections.

2. The section of pipe to be replaced shall be isolated by plugging and/or by-pass pumping or by any other method proposed by the Developer/Contractor and approved by the City of Longview. All plugging and bypass pumping shall be considered subsidiary to the cost of removal and replacement of pipe.

B. Excavation

1. Remove and dispose of the existing pipe and concrete encasement, if any. This shall be phased and coordinated with its replacement so as to minimize public inconvenience.

2. The trench bottom shall be reshaped to accommodate the new pipe and embedment or encasement as required.

C. Bedding: In accordance with Section 02225 and as shown on the Plans.

D. Placing and Laying

1. In accordance with Section 3.2 E above.

2. Make connections to existing or proposed manholes or cleanouts and to existing pipe remaining in place.

3. Install wyes or tees, with branches temporarily plugged, to make reconnections to existing service laterals, if any.

4. Except for testing, service shall be maintained at all times. Where necessary, services shall be temporarily reconnected to the new main.

3.4 TESTING AND INSPECTION

A. Low Pressure Air Test:

1. A low pressure air test shall be performed after completing a section of sewer line in accordance with the following:

   a. The procedure for the low pressure air test shall conform to the procedures described in ASTM C-828, ASTM C-924, ASTM F-1417 or other appropriate procedures, except for testing times.

   b. The test times shall be as outlined below.

   c. For sections of pipe less than 36-inch average inside diameter, the following procedure shall apply unless the pipe is to be joint tested.

   d. The pipe shall be pressurized to 3.5 psi greater than the pressure exerted by groundwater above the pipe.

   e. Once the pressure is stabilized, the minimum time allowable for the pressure to drop from 3.5 pounds per square inch gauge to 2.5 pounds per square inch gauge shall be computed from the following equation:

$$T \equiv \frac{0.085 \times D \times K}{Q}$$

T = time for pressure to drop 1.0 pound per square inch gauge in seconds
K = 0.000419 x D x L, but not less than 1.0
D = average inside pipe diameter in inches
L = length of line of same pipe size being tested, in feet
Q = rate of loss, 0.0015 cubic feet per minute per square foot internal surface

   f. Since a K value of less than 1.0 shall not be used, there are minimum testing times for each pipe diameter as follows:

Pipe Diameter (inches)	Minimum Time (seconds)	Maximum Length for Minimum Time (feet)	Time for Longer Length (seconds/foot)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

g. The test may be stopped if no pressure loss has occurred during the first 25% of the calculated testing time.

h. If any pressure loss or leakage has occurred during the first 25% of the testing period, then the test shall continue for the entire test duration as outlined above or until failure.

B. Infiltration and Exfiltration Test:

1. Infiltration and Exfiltration tests shall conform to 30 TAC 217.57(a)(2) and shall be performed under the observation of the Owner and City of Longview.

2. If an Infiltration or Exfiltration Test produces results that exceed the maximum allowable limit as stated in 30 TAC 217.57 (a)(2) and as outlined below, the Developer/Contractor shall repair or replace all necessary sections of the sewer line to bring the line into compliance with such standards.

3. The total infiltration shall not exceed 50 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet above the crown of the pipe at the upstream manhole or two feet above the existing ground water whichever is greater.

4. When pipes are installed below the groundwater level, an infiltration test shall be used in lieu of an Exfiltration test.

5. For pipe constructed within the 25-year flood plain, the Infiltration or Exfiltration shall not exceed 10 gallons per inch diameter per mile of pipe per 24 hours at a minimum test head of 2.0 feet.

6. If the Exfiltration exceeds the maximum allowable amount, the Developer/Contractor shall replace or repair the section of the sewer line necessary to meet the specified limits.

C. Deflection Test:

1. A Deflection Test shall be performed on all flexible pipes (PVC).

2. The deflection test shall conform to the requirements of 30 TAC 217.57(b) as outlined below.

3. For collection pipes with an inside diameter less than 27 inches, deflection measurement requires a Rigid Mandrel. Flexible mandrels shall be prohibited.

   a. The Rigid Mandrel shall have an outside diameter equal to 95% of the average inside diameter of the pipe.

   b. The Rigid Mandrel shall be constructed of metal or a rigid plastic material and shall be able to withstand 200 psi without being deformed and shall have a length of at least 75% of the inside diameter of the pipe.

   c. The Mandrel shall have 9 or more odd number of runners.

   d. Each Mandrel shall use a separate proving ring.

   e. The Mandrel shall have 9 or more odd number of runners.

4. Television Inspection shall not substitute for a Deflection Test.

5. Mechanical pulling devices shall not be used during Testing.

6. Deflection Tests shall be performed no sooner than 30 days following final placement of backfill.

7. If the deflection exceeds the maximum allowable amount (5%), the Developer/Contractor shall replace or repair the section of the sewer line necessary to meet the specified limits.

D. Upon completion of all required testing, the Developer/Contractor shall provided a signed and notarized affidavit certifying that the system has been tested and meets applicable requirements.

E. System Flushing:

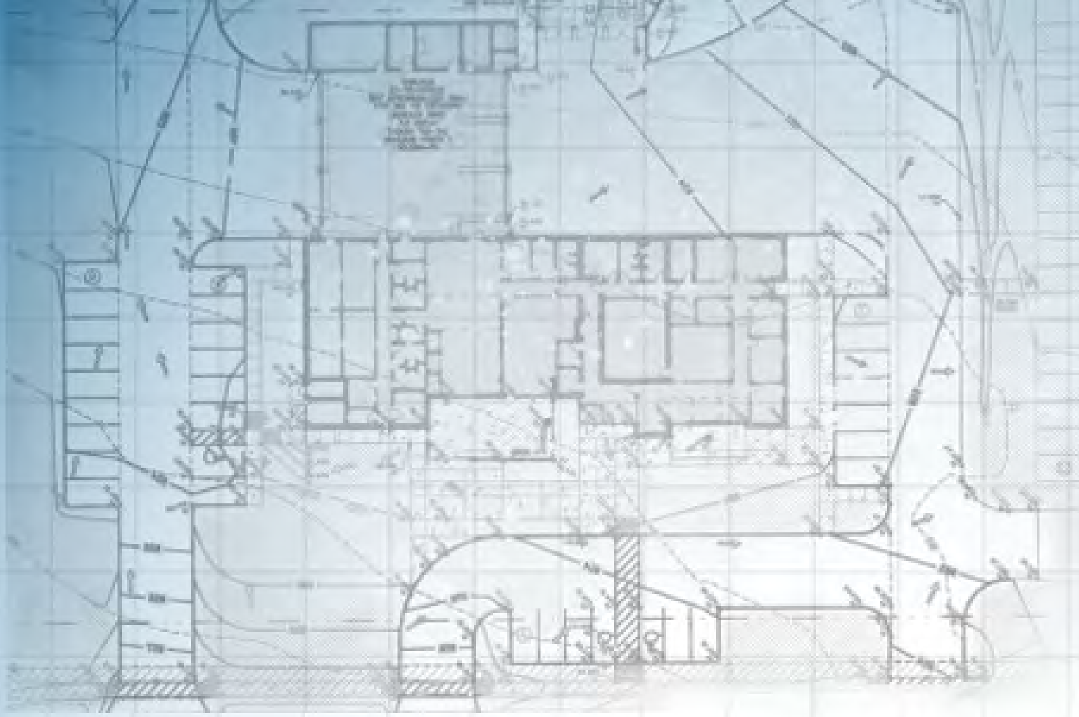
1. Upon completion of each sewer line or segment of line the Developer/Contractor shall flush the sewer line with a sufficient quantity of clean water. The flushing shall be performed until the water runs clear and clean.

2. The quantity of water shall be sufficient to properly flush the line and shall not be less than 200 gallons per minute. The Developer/Contractor shall be responsible for acquiring the necessary water and facilities for flushing.

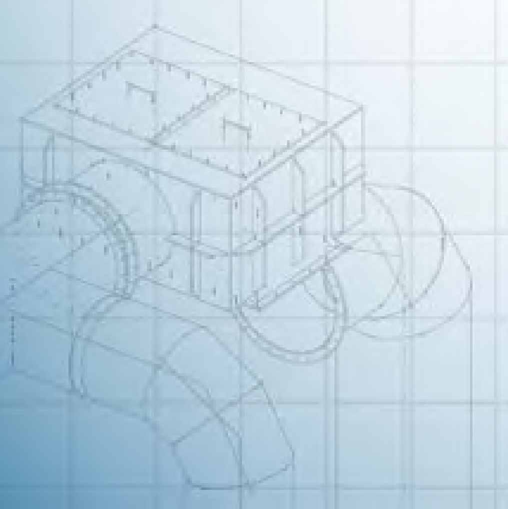
F. Final Inspection:

1. Prior to final inspection, the Developer/Contractor shall complete all work on the portion of the line to be tested. The ditches shall be dressed and debris removed.
2. The final inspection shall include the entire length of the line and include clean up.
3. All defects noted shall be repaired by Developer/Contractor at his own expense, prior to final payment.

END OF SECTION



Street Design Guidelines



DESIGN GUIDELINES
FOR
SUBDIVISION STREET IMPROVEMENTS
IN
LONGVIEW, TEXAS
AND
EXTRA-TERRITORIAL JURISDICTION

October, 2018

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CHAPTER 1 GENERAL INFORMATION

I. PURPOSE

The purpose of these guidelines is to inform engineers, planners, and others concerned with subdivision design of the basic procedures and requirements for pavement design for subdivisions. These requirements are for use as guidelines and minimum standards only, and are not to be construed as a waiver by the City of Longview of the right to require a stringent design as conditions warrant.

II. DESIGN

All construction plans for subdivision improvements are to be prepared under the direction and supervision of a qualified professional engineer licensed in the state of Texas and such plans shall be dated and bear the seal and signature of that engineer.

A. APPROVALS

Approval of the construction plans by the City Engineer is a prerequisite for final plat approval.

III. INSPECTION

An inspector for the City of Longview will inspect all construction of the improvements described herein. No work of any nature shall begin without authorization of the City Engineer. The contractor shall cooperate with the inspector in coordinating construction and inspections, and shall notify the inspector so he may be present to inspect construction. Failure to notify the inspector properly may result in the City of Longview not accepting that work. The contractor would then be required to remove and reconstruct the improvements. The inspector shall not have the authority to approve defective work and his acceptance of improvements will not constitute any waiver of the contractor's responsibility in adhering to the construction plans and specifications, nor the design engineer's responsibility for the inspection of construction of his design.

CHAPTER 2 PAVING

I. GENERAL

The purpose of these guidelines is to guide the engineer in design and preparation of plans and specifications for the construction of public paving improvements. All paving improvements shall be designed and constructed in accordance with City of Longview requirements. Materials and construction methods for paving work (technical specifications) shall conform to the Texas Department of Transportation 2014 Standard Specifications for Construction of Highways, Streets, and Bridges, except where specifically noted otherwise in this publication. Where any questions arise as to the interpretation of the standards of design, the decision of the City Engineer will be final.

II. ROADWAY DESIGN

A. ROADWAY PAVEMENT SECTION DESIGN:

The City of Longview does not have a typical or standard pavement section; therefore, this section presents the method for the thickness design of roadway pavements. It contains the design requirements for various street widths and traffic conditions, various subgrade support soils, and various types of pavement materials. Pavement design options are based on a combination of the above variables.

Step 1 - Determine the structural support of the roadway's existing subgrade. The subgrade strength is defined by having a California Bearing Ratio (CBR) test performed in accordance with ASTM Method D 1883-94 (Standard Test Method for Bearing Ratio of Laboratory - Compacted Soils) by a geotechnical and construction materials testing lab.

Soil borings are to be placed along the proposed roadway to provide a representative view of the existing subgrade. Laboratory tests are to be performed on these representative soil samples to determine natural moisture content, liquid and plastic limits, and percent passing the No. 200 sieve. These tests are to be performed in accordance with ASTM Methods D 2216, D 4318, and D 422, respectively. Additional CBR tests are to be performed where above lab tests reveal variations in the subgrade according to the "Unified Soil Classification". Unified Soil Classifications are to be determined using procedures in accordance with ASTM Method D 2487. Additional CBR tests are to be performed on soil samples where roadway grades produce cuts into varying subgrade soils.

The existing subgrade shall be able to provide a stable working platform when compacted to a density of 95% standard proctor at optimum moisture content according to ASTM Method D 698. All organic and unstable materials are to be removed during construction and replaced with select fill. A geotextile material may be used at the discretion of the design engineer to enhance subgrade support.

Step 2 - Identify the street class. Street classifications are determined by the following attributes: Metropolitan Transportation Plan (MTP) designation, zoning, existing and future traffic volumes, and street width. (See Table II – A - 1). Choose the street type which matches the design roadway's attributes. If a design roadway's attributes fall between street classes, for example, a street that has both residential and commercial zoning, choose the street class which produces the most stringent pavement design.

TABLE II – A - 1
STREET CLASSIFICATIONS

Class	Zoning	Width (B-B)	Maximum Avg. Vehicle	Percent Trucks[1]	Avg. Gross Weight (Lbs)[2]	Single Axle Load Limit (Lbs)
Lane	Residential	29'	500	2	20,000	20,000
Sub-Collector	Residential	37'	4,800	5	25,000	20,000
Collector	Residential	37'	9,600	5	30,000	20,000
Collector	Commercial	53'	11,200	15	30,000	20,000
Collector	Industrial	53'	9,600	20	30,000	20,000
Arterial	All	66'	24,300	15	30,000	20,000

1. The Asphalt Institute, U.S. Federal Highway Administration
2. The Asphalt Institute, U.S. Federal Highway Administration.

Step 3 - Determine the total thickness of the pavement section for each type of pavement design. Four pavement design tables are provided (Tables II – A – 2, II – A – 3, II – A – 4, and II – A - 5), one for flexible base pavement, one for full-depth hot mix asphaltic concrete pavement, and one for concrete pavement. Each design table is divided into street classification columns and subgrade CBR % rows. Using the street class identified in Step 2, follow this column down until it intersects the subgrade CBR % row determined in Step 1. This number represents the total thickness of pavement section, in inches, to be used.

Step 4 - Determine the thickness of base. The minimum surface thickness is found at the bottom of each street class column. To obtain the thickness of base, subtract the surface thickness from the total thickness of the pavement section. The typical placement for the geogrid on geogrid-reinforced flexible base pavements is at the base/subgrade interface. On roadways that have an existing subgrade CBR % greater than 12, step four often provides the most economical design and the design process could be stopped (see Example Problem II – A - 1), however, for roadways that have subgrade CBR% less than 12, the designing process should continue to provide an economical design.

Step 5 - Select a subbase material if the process is continued. The subbase can be the existing subgrade treated with lime or cement, or a select fill material, such as iron ore topsoil. The subbase material is sampled and the subbase strength is defined by having a CBR test performed.

Step 6 - Select the new thickness of base and surfacing. Taking into account the subbase CBR % value and using the pavement design table again, follow the same street class column down until it intersects the subbase CBR % determined in Step 5. This number represents the total thickness, in inches, of base and surfacing using the subbase in lieu of the existing subgrade. The base thickness is found by subtracting the surface thickness from the total thickness of base and surfacing.

Step 7 - Determine the thickness of the subbase material selected in Step 5. This is found by subtracting the total thickness of base and surfacing in Step 6 from the total thickness of the pavement section in Step 3. The minimum thickness of a subbase is six inches.

Step 8 - Determine the overall pavement section design. Add the surface thickness and base thickness found in Step 6 to the subbase thickness found in Step 7. (See Example Problem II – A - 2)

To determine the most economical and efficient roadway pavement design, the above process should be performed using each pavement design table, varying the subbase materials, and then applying current construction costs.

Step 9 - Design submittal. Submit the recommended roadway pavement section design on Form II – A - 9 to the City Engineer for approval. Also submit the results of the CBR test(s) performed by a geotechnical and construction materials testing lab.

TABLE II – A - 2

FLEXIBLE BASE PAVEMENT DESIGN

DESIGN PERIOD = 20 YEARS

<table>
<tr><th colspan="6">TOTAL PAVEMENT SECTION</th></tr>
<tr><th rowspan="2">SUBGRADE OR SUBBASE CBR %</th><th>LOCAL
29' B – B
RESIDENTIAL</th><th>SUB-COLLECTOR AND COLLECTOR
37' B - B
RESIDENTIAL</th><th>COLLECTOR
53' B – B
COMMERCIAL</th><th>COLLECTOR
53' B - B
INDUSTRIAL</th><th>ARTERIAL
66' B - B</th></tr>
<tr><th>Inches</th><th>Inches</th><th>Inches</th><th>Inches</th><th>Inches</th></tr>
<tr><td>2</td><td>32</td><td>35</td><td>36.5</td><td>38</td><td>39</td></tr>
<tr><td>3</td><td>24</td><td>27.5</td><td>29</td><td>30</td><td>31</td></tr>
<tr><td>4</td><td>21</td><td>23</td><td>24</td><td>24.5</td><td>25</td></tr>
<tr><td>5</td><td>18</td><td>19.5</td><td>20.5</td><td>21</td><td>21.5</td></tr>
<tr><td>6</td><td>16</td><td>17.5</td><td>18</td><td>18.5</td><td>19</td></tr>
<tr><td>7</td><td>14</td><td>16</td><td>16.5</td><td>17</td><td>17.5</td></tr>
<tr><td>8</td><td>13</td><td>14.5</td><td>15</td><td>15.5</td><td>16</td></tr>
<tr><td>9</td><td>12</td><td>13.5</td><td>14</td><td>14.5</td><td>15</td></tr>
<tr><td>10</td><td>11</td><td>12.5</td><td>13</td><td>13</td><td>13.5</td></tr>
<tr><td>12</td><td>9.5</td><td>10.5</td><td>11</td><td>11.5</td><td>12</td></tr>
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<tr><td>25</td><td>7.5</td><td>8</td><td>9</td><td>9.5</td><td>10</td></tr>
<tr><td colspan="6">MINIMUM SURFACE & BASE SECTION</td></tr>
<tr><td>HMAC</td><td>2</td><td>2</td><td>2</td><td>2.5</td><td>3</td></tr>
<tr><td>BASE</td><td>5.5</td><td>6</td><td>7</td><td>7</td><td>7</td></tr>
<tr><td colspan="6">MINIMUM STABILIZED SUBBASE SECTION</td></tr>
<tr><td></td><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td></tr>
<tr><td colspan="6">FLEXIBLE BASE SPECIFICATIONS</td></tr>
<tr><td colspan="6">Texas Department of Transportation "2014 Standard Specifications For Construction of Highways, Streets, And Bridges" Item 247 shall govern except California Bearing Ratio Tests will replace Triaxial Classes and the maximum PI = 9. The base shall be compacted to a density of 98% modified proctor at optimum moisture content according to ASTM Method D 1557.</td></tr>
<tr><td>Grade</td><td>1, 2, 3</td><td>1, 2, 3</td><td>1, 2</td><td>1, 2</td><td>1, 2</td></tr>
<tr><td>Minimum CBR% of Base</td><td>40</td><td>60</td><td>70</td><td>70</td><td>80</td></tr>
</table>

TABLE II – A – 3

FULL DEPTH HMAC PAVEMENT DESIGN

DESIGN PERIOD = 20 YEARS

TOTAL PAVEMENT SECTION					
SUBGRADE OR SUBBASE CBR %	LOCAL 29' B – B RESIDENTIAL	SUB-COLLECTOR AND COLLECTOR 37' B - B RESIDENTIAL	COLLECTOR 53' B – B COMMERCIAL	COLLECTOR 53' B - B INDUSTRIAL	ARTERIAL 66' B - B
	Inches	Inches	Inches	Inches	Inches
2	12.5	14	15.5	16	16.5
3	10.5	12	13.5	13.5	14
4	9.5	10.5	12	12	12.5
5	8.5	9.5	11	11	11.5
6	8	9	10	10	10.5
7	7.5	8.5	9.5	9.5	10
8	7.5	8	9	9	9.5
9	7	7.5	8.5	8.5	9
10	6.5	7.5	8	8.5	9
12	6	7	7.5	8	8
15	5.5	6.5	7	7.5	7.5
20	5.5	6	7	7	7
25	5.5	6	6.5	7	7
MINIMUM HMAC SURFACE & BASE SECTION					
TYPE "D"	1.5	2	2	2.5	3
TYPE "B"	4	4	4.5	4.5	4
MINIMUM STABILIZED SUBBASE SECTION					
	6	6	6	6	6
HOT MIX ASPHALTIC CONCRETE SPECIFICATIONS					
Texas Department of Transportation "2014 Standard Specifications For Construction of Highways, Streets, And Bridges" Item 341 with coarse aggregate being crushed so that a minimum of 50% of particles retained on # 4 sieve shall have more than one crushed face when tested in accordance with Test Method Tex-413 A (Particle Count).					

TABLE 4.4

CONCRETE PAVEMENT DESIGN

DESIGN PERIOD = 35 YEARS

TOTAL PAVEMENT SECTION						
SUBGRADE OR SUBBASE CBR %	Local 29' B-B		COLLECTOR 39' B-B Local	COLLECTOR 59' B-B Commercial	COLLECTOR 64' B-B Industrial	ARTERIAL 66' B-B
	Cul-De-Sac	Local				
2	7	8	9	10	11	11
3	6	7	8	9	10	10
4	6	7	8	9	10	10
5	6	6	7	8	9	9
6	6	6	7	8	9	9
7	6	6	7	8	9	9
8	6	6	7	8	9	9
9	6	6	7	8	9	9
10	5	6	7	8	8	8
12	5	6	6	7	8	8
15	5	6	6	7	7	7
20	5	5	6	7	7	7
25	5	5	6	6	7	7
MINIMUM STABILIZED SUBBASE SECTION						
	6	6	6	6	6	6
CONCRETE SPECIFICATIONS						
Texas Department of Transportation "2014 Standard Specifications For Construction of Highways, Streets And Bridges", Item 360 with a minimum compression strength of 3000 PSI at 28 days (5 sacks of cement per cubic yard). Pavement design shall be Concrete Pavement Contraction Design (CPCD) as shown in the City of Longview Standard Details						

EXAMPLE PROBLEM 4.1

Required: Determine a pavement section for a collector street in a commercial area.

Solution A: FLEXIBLE BASE PAVEMENT SECTION

Step 1 - From testing the roadway's existing subgrade, a CBR of 12% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 59' B-B commercial street.

Step 3 - From Table 4.2, "Flexible Base Pavement Design", the total thickness of the pavement section was determined to be 11".

Step 4 - The thickness of base without a subbase is found by subtracting the minimum surface from the total thickness; 11" - 2" = 9". The design process could stop here with an overall pavement section design of 2" HMAC Surface on 9" Flexible Base. However, a treated subgrade may produce a more economical design.

Step 5 - The existing subgrade is treated with lime, (say 6%) and testing shows the new subbase material has a CBR of 20%.

Step 6 - From Table 4.2, the new total thickness of base and surfacing is 9". The new thickness of base with a subbase is found by subtracting the minimum surface from the new total thickness of base and surface; 9" - 2" = 7".

Step 7 - The subbase thickness is found by subtracting Step 6 from Step 3; 11" - 9" = 2". However, minimum subbase thickness is 6".

Step 8 - The overall pavement section design is found by adding Step 6 to Step 7;

2" HMAC Surface on 7" Flexible Base on 6" Lime Treated Subbase.

Solution B: FULL DEPTH HMAC PAVEMENT SECTION

Step 1 - From testing the roadway's existing subgrade, a CBR of 12% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 59' B-B commercial street.

Step 3 - From Table 4.3, "Full Depth HMAC Pavement Design", the total thickness of the pavement section was determined to be 7.5".

Step 4 - The thickness of base without a subbase is found by subtracting the minimum surface from the total thickness; 7.5" - 2" = 5.5". The design process could stop here with an overall pavement section design of 2" HMAC Surface on 5.5" HMAC Base.

Solution C: CONCRETE PAVEMENT SECTION

Step 1 - From testing the roadway's existing subgrade, a CBR of 12% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 59' B-B commercial street.

Step 3 - From Table 4.4, "Concrete Pavement Design", the total thickness of the pavement section was determined to be 7". The design process could stop here with an overall pavement section design of 7" Concrete Pavement on untreated subgrade.

EXAMPLE PROBLEM 4.2

Required: Determine a pavement section for a local street in a residential subdivision.

Solution A: FLEXIBLE BASE PAVEMENT SECTION

Step 1 - From testing the roadway's existing subgrade, a CBR of 3% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 29' B-B residential street.

Step 3 - From Table 4.2, "Flexible Base Pavement Design", the total thickness of the pavement section was determined to be 24".

Step 4 - The thickness of base without a subbase is found by subtracting the minimum surface from the total thickness; 24" - 2" = 22". A base thickness of 22" is excessive, and the design process should continue to find a more economical design.

Step 5 - The existing subgrade is treated with lime, (say 6%) and testing shows the new subbase material has a CBR of 9%.

Step 6 - From Table 4.2, the new total thickness of base and surface is 12". The new thickness of base with a subbase is found by subtracting the minimum surface from the new total thickness of base and surface; 12" - 2" = 10".

Step 7 - The subbase thickness is found by subtracting Step 6 from Step 3;
24" - 12" = 12".

Step 8 - The overall pavement section design is found by adding Step 6 to Step 7;
2" HMAC Surface on 10" Flexible Base on 12" Lime Treated Subbase.

Solution B: FULL DEPTH HMAC PAVEMENT SECTION:

Step 1 - From testing the roadway's existing subgrade, a CBR of 3% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 29' B-B residential street.

Step 3 - From Table 4.3, "Full Depth HMAC Pavement Design:, the total thickness of the pavement section was determined to be 10.5".

Step 4 - The thickness of base without a subbase is found by subtracting the minimum surface from the total thickness; 10.5" - 2" = 8.5".

Step 5 - The existing subgrade is treated with lime, (say 6%) and testing shows the new subbase material has a CBR of 9%.

Step 6 - From Table 4.2, the new total thickness of base and surface is 7". The new thickness of base with a subbase is found by subtracting the minimum surface from the new total thickness of base and surface; 7" - 2" = 5".

Step 7 - The subbase thickness is found by subtracting Step 6 from Step 3; 10.5"' - 7" = 3.5", however, minimum subbase thickness is 6".

Step 8 - The overall pavement section design is found by adding Step 6 to Step 7; 2" HMAC Surface on 5" Flexible Base on 6" Lime Treated Subbase.

Solution C: CONCRETE PAVEMENT DESIGN:

Step 1 - From testing the roadway's existing subgrade, a CBR of 3% was obtained.

Step 2 - From Table 4.1, the street classification was determined to be a 29' B-B residential street.

Step 3 - From Table 4.4, "Concrete Pavement Design", the total thickness of the pavement section was determined to be 7".

Step 4 - The design process could stop here with an overall pavement section design of 7" Concrete Pavement on untreated subgrade. However, a treated subgrade may produce a more economical design.

Step 5 - The existing subgrade is treated with lime, (say 6%) and testing shows the new subbase material has a CBR of 9%.

Step 6 - From Table 4.4, the new total thickness of pavement is 6".

Step 7 - The subbase thickness is found by subtracting Step 6 from Step 3; 7" - 6" = 1", however, minimum subbase thickness is 6".

Step 8 - The overall pavement section design is found by adding Step 6 to Step 7; 6" concrete Pavement on 6" lime treated subbase.

FORM 4.1

CITY OF LONGVIEW
ROADWAY PAVEMENT SECTION DESIGN

SUBDIVISION/PROJECT NAME:
STREET NAME:

Step 1 California Bearing Ratio Test (CBR) of Existing Subgrade

Boring #	Station #	Offset Distance	Depth of Material Tested	CBR %

Step 2 Street Classification:

Step 3 Total Thickness of Pavement Section.

Flexible Base (Table 4.2)	Full Depth HMAC (Table 4.3)	Concrete (Table 4.4)	Geogrid Reinforced (Table 4.5)

Step 4 Thickness of Base.

	Flexible Base	Full Depth HMAC	Geogrid Reinforced
Total Thickness of Pavement Section (Step 3)			
Surface Thickness	(-)	(-)	(-)
Base Thickness			

Step 5 Subbase Material. (If used)

	Flexible Base	Full Depth HMAC	Concrete	Geogrid Reinforced
Type of Subbase				

Step 6 Thickness of Base & Surfacing. (If A Subbase Is Used)

	Flexible Base	Full Depth HMAC	Concrete	Geogrid Reinforced
Total Thickness of Base & Surfacing				
Surface Thickness	(-)	(-)	(-)	(-)
Base Thickness				

Step 7 Subbase Material Thickness. (If A Subbase Is Used)

	Flexible Base	Full Depth HMAC	Concrete	Geogrid Reinforced
Total Pavement Section Thickness (Step # 3)				
Total Thickness of Base and Surfacing (Step # 6)	(-)	(-)	(-)	(-)
Subbase Thickness (Minimum 6")				

Step 8 Overall Pavement Section Design

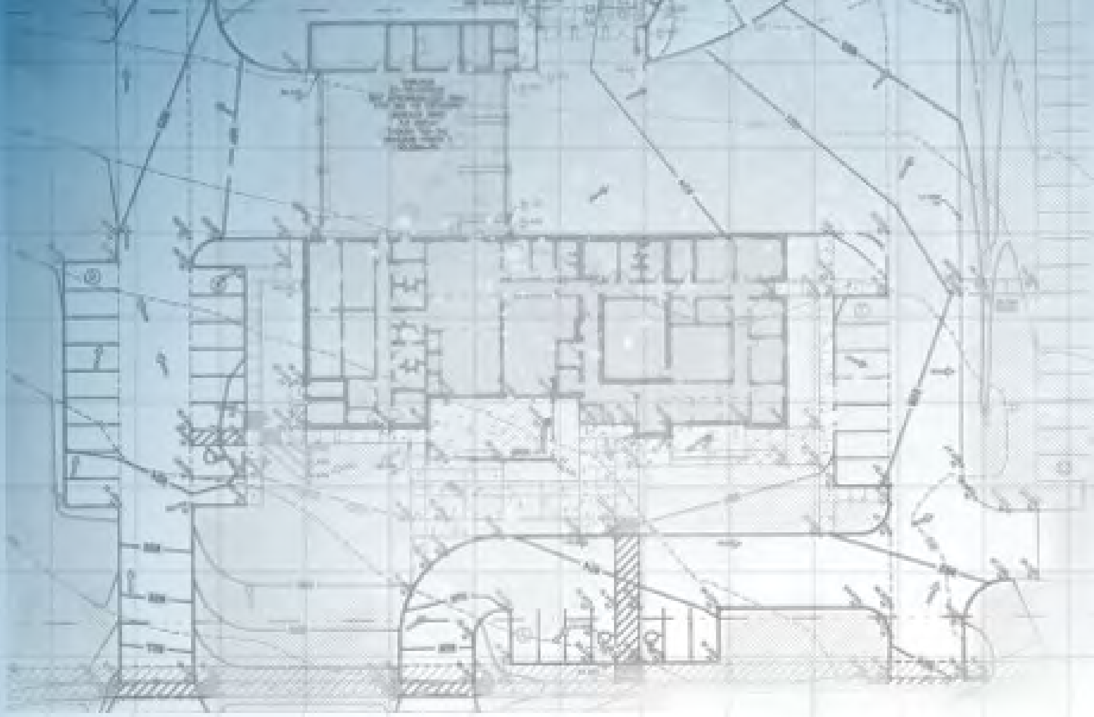
	Flexible Base	Full Depth HMAC	Concrete	Geogrid Reinforced
Surface Thickness				
Base Thickness				
Subbase Thickness				

RECOMMENDATION:	THICKNESS	MATERIAL
SURFACE	______________	
BASE	______________	
SUBBASE	______________	

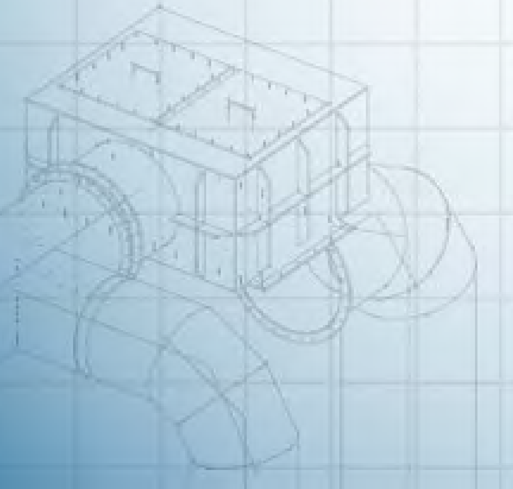
SIGNATURE:

TITLE:

DATE:

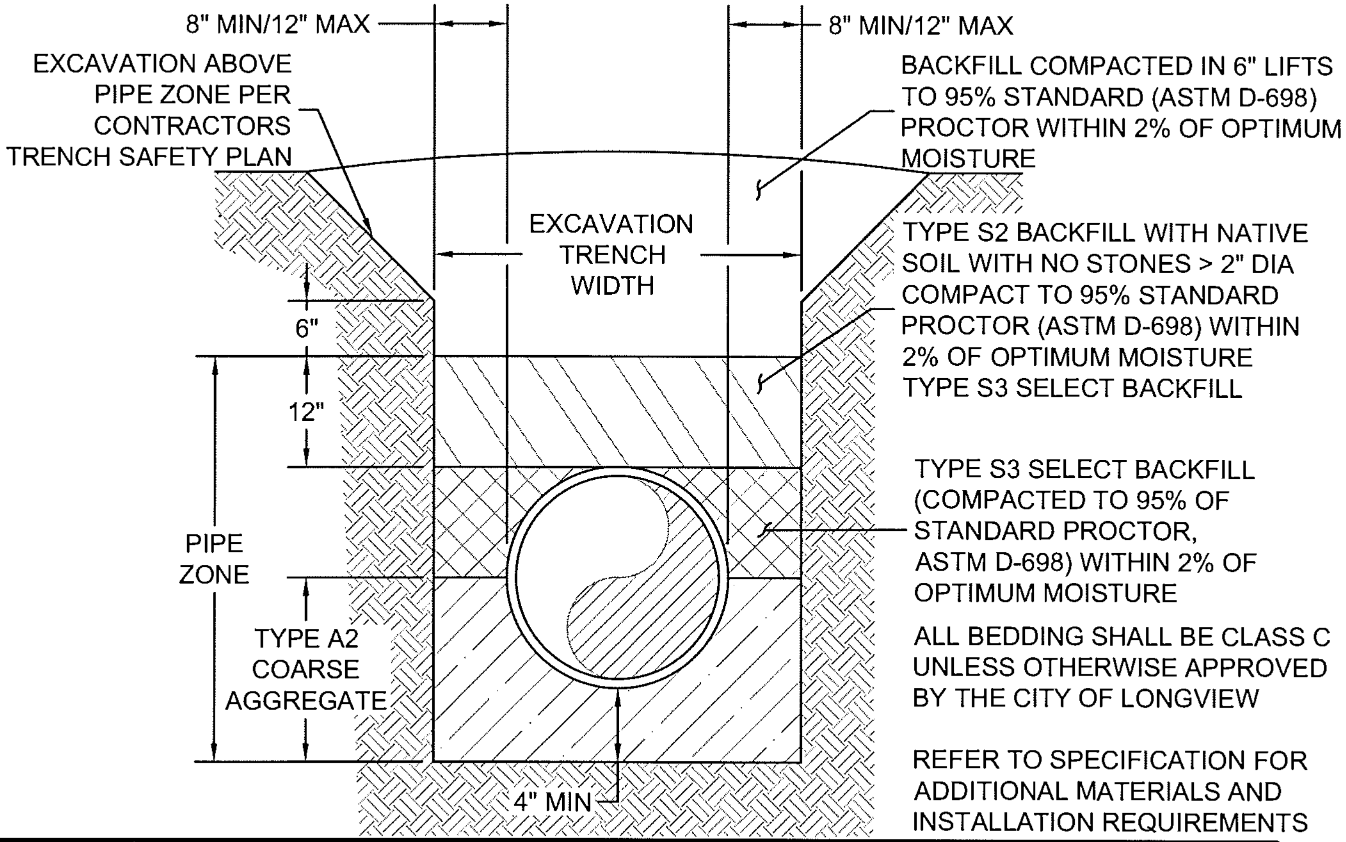


Engineering Details - Sanitary Sewer



SANITARY SEWER DETAILS

Sanitary Sewer Line Installation Class C Embedment 4
Sanitary Sewer Line Installation Class D Embedment 5
Sanitary Sewer Service 6
Sanitary Sewer Service for Mains 7-ft and Deeper 7
Sewer Line Transition Coupling 8
Sewer Water Crossing 9
Sewer Main Cleanout 10
Pipe Casing Detail Page 1 of 4 11
Pipe Casing Detail Page 2 of 4 12
Pipe Casing Detail Page 3 of 4 13
Pipe Casing Detail Page 4 of 4 14
Sewer Line Creek Crossing 15
Tie-In to Existing Manhole 16
Sanitary Sewer Manhole 17
Sanitary Sewer Manhole Notes 18
Sewer Manhole Finished Grade Adjustment 19
Standard Sewer Manhole Ring and Cover 20
Watertight Manhole Ring and Cover 21
Sewer Manhole Vent 22
Sewer Drop Manhole Connection 23
Sewer Manhole Invert 24
Sign Marker Detail 25


8" MIN/12" MAX
8" MIN/12" MAX
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
BACKFILL COMPACTED IN 6" LIFTS TO 95% STANDARD (ASTM D-698) PROCTOR WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION TRENCH WIDTH
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT TO 95% STANDARD PROCTOR (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE TYPE S3 SELECT BACKFILL
6"
12"
PIPE ZONE
TYPE S3 SELECT BACKFILL (COMPACTED TO 95% OF STANDARD PROCTOR, ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
TYPE A2 COARSE AGGREGATE
4" MIN

ALL BEDDING SHALL BE CLASS C UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW

REFER TO SPECIFICATION FOR ADDITIONAL MATERIALS AND INSTALLATION REQUIREMENTS

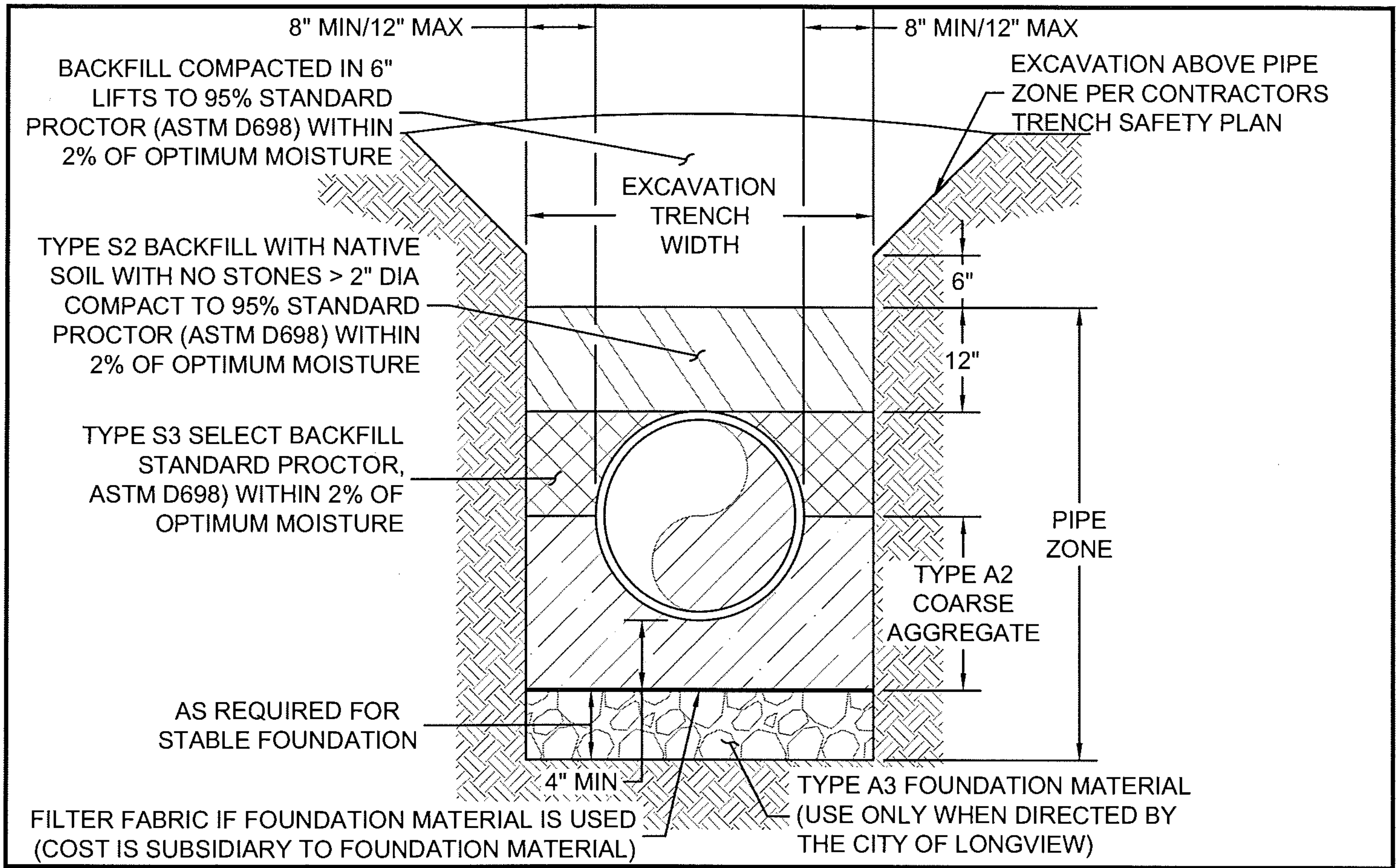
TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

SANITARY SEWER PIPE MATERIAL NOTES:

A. PIPE:

1. POLYVINYL CHLORIDE PIPE (PVC)
   - a. PVC PIPE SHALL BE IN ACCORDANCE WITH ASTM D-3034 WITH INTEGRAL WALL BALL AND SPIGOT JOINTS.
   - b. PVC PIPE SHALL BE MANUFACTURED FROM CLEAN, VIRGIN, NSF APPROVED PVC COMPOUND MEETING THE REQUIREMENTS OF CELL CLASS 12454-B AS DEFINED BY STM D-1784.
   - c. PIPES SHALL BE PRODUCED WITH A WALL THICKNESS CORRESPONDING TO DIMENSION RATIO SDR-26, WITH A PIPE STIFFNESS VALVE OF 115 PSI WHEN TESTED IN ACCORDANCE WITH ASTM D-2412.
   - d. PVC PIPE AND FITTINGS SHALL BE NEW AND SUPPLIED FROM APPROVED MATERIALS AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST. NO OTHER MATERIALS ARE ACCEPTABLE.
2. DUCTILE IRON (DI) PIPE:
   - a. DUCTILE IRON PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 WITH THICKNESS AS DETERMINED BY ANSI/AWWA C150/A21.50.
   - b. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE LINED WITH (PROTECTO 401) PER ANSI/AWWA C104/A21.4 AND HAVE A BITUMINOUS COATED EXTERIOR ACCORDING TO ANSI/AWWA C151/A21.51 OR C115/A21.15.
   - c. PRESSURE CLASS 150 SHALL BE USED UNLESS OTHERWISE NOTED.
   - d. DUCTILE IRON PIPE AND FITTINGS SHALL BE NEW AND SUPPLIED FROM APPROVED MATERIALS AS LISTED ON THE CITY OF LONGVIEW APPROVED UTILITY PRODUCTS LIST. NO OTHER MATERIALS ARE ACCEPTABLE.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SANITARY SEWER LINE INSTALLATION CLASS C EMBEDMENT
	LATEST REVISION: 3/21/2018		

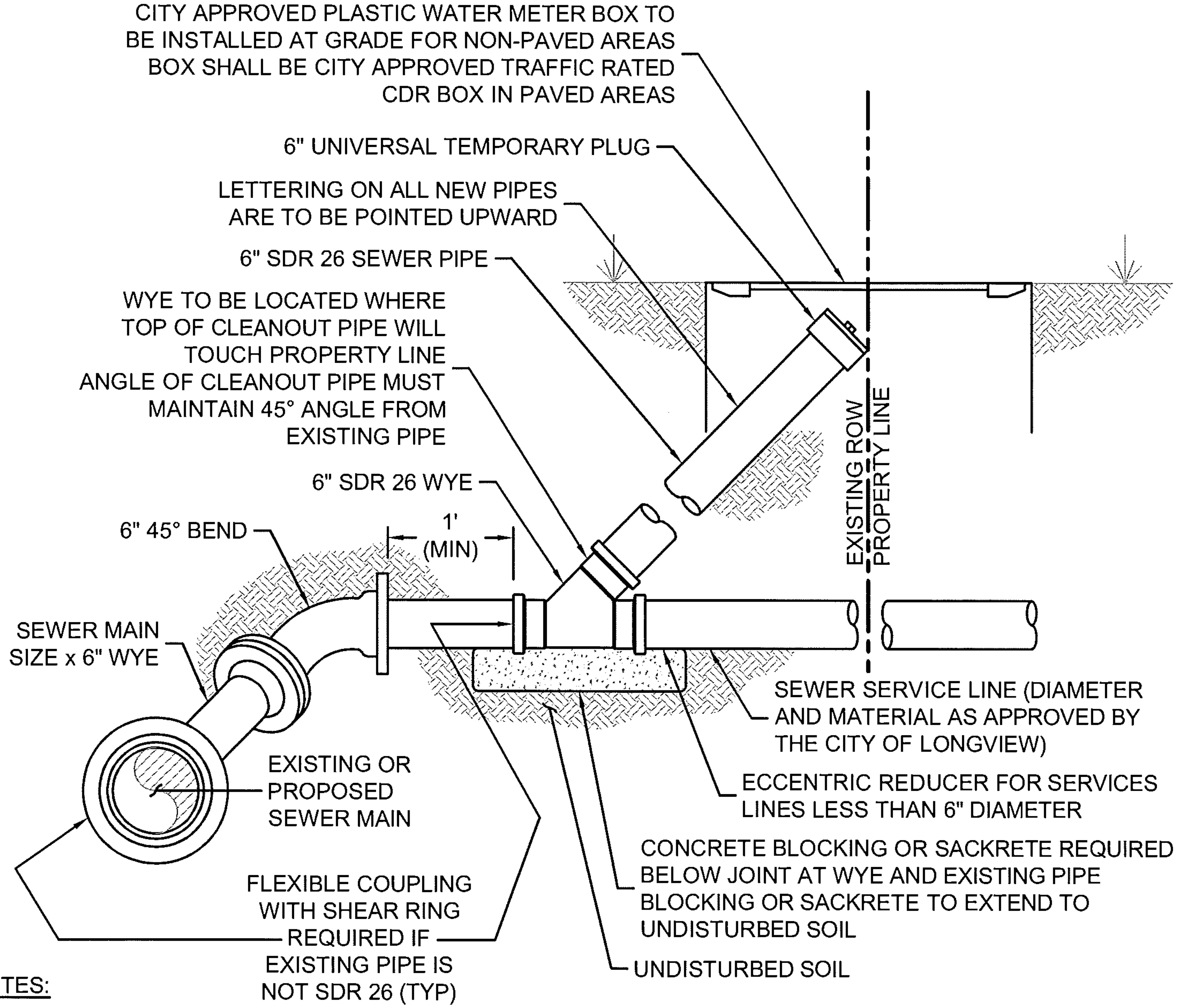

8" MIN/12" MAX
8" MIN/12" MAX
BACKFILL COMPACTED IN 6" LIFTS TO 95% STANDARD PROCTOR (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
EXCAVATION TRENCH WIDTH
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT TO 95% STANDARD PROCTOR (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE
6"
12"
TYPE S3 SELECT BACKFILL STANDARD PROCTOR, ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE
PIPE ZONE
TYPE A2 COARSE AGGREGATE
AS REQUIRED FOR STABLE FOUNDATION
4" MIN
FILTER FABRIC IF FOUNDATION MATERIAL IS USED (COST IS SUBSIDIARY TO FOUNDATION MATERIAL)
TYPE A3 FOUNDATION MATERIAL (USE ONLY WHEN DIRECTED BY THE CITY OF LONGVIEW)

TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 NO. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE A3	COARSE STONE OR CRUSHED GRAVEL. FOUNDATION MATERIAL SHALL BE PIT RUN ANGULAR CRUSHED, NATURAL WASHED STONE FREE OF SHALE, CLAY, FRIABLE MATERIAL AND DEBRIS; WELL GRADED BETWEEN 1" AND 3" IN SIZE, WITH A MINIMUM OF 90% RETAINED ON A 1" SIEVE.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

SANITARY SEWER PIPE MATERIAL NOTES:

1. POLYVINYL CHLORIDE PIPE (PVC)
   a. PVC PIPE SHALL BE IN ACCORDANCE WITH ASTM D-3034 WITH INTEGRAL WALL BALL AND SPIGOT JOINTS.
   b. PVC PIPE SHALL BE MANUFACTURED FROM CLEAN, VIRGIN, NSF APPROVED PVC COMPOUND MEETING THE REQUIREMENTS OF CELL CLASS 12454-B AS DEFINED BY STM D-1784.
   c. PIPES SHALL BE PRODUCED WITH A WALL THICKNESS CORRESPONDING TO DIMENSION RATIO SDR-26, WITH A PIPE STIFFNESS VALVE OF 115 PSI WHEN TESTED IN ACCORDANCE WITH ASTM D-2412.
2. DUCTILE IRON (DI) PIPE:
   a. DUCTILE IRON PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 WITH THICKNESS AS DETERMINED BY ANSI/AWWA C150/A21.50.
   b. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE (PROTECTO 401) PER ANSI/AWWA C104/A21.4 AND HAVE A BITUMINOUS COATED EXTERIOR ACCORDING TO ANSI/AWWA C151/A21.51 OR C115/A21.15.
   c. PRESSURE CLASS 150 SHALL BE USED UNLESS OTHERWISE NOTED.
   d. DUCTILE IRON PIPE AND FITTINGS SHALL BE NEW AND SUPPLIED FROM VENDERS INCLUDED ON THE LATEST VERSION OF THE CITY OF LONGVIEW'S APPROVED UTILITY PRODUCTS LIST. NO OTHER SUPPLIERS SHALL BE ACCEPTED.

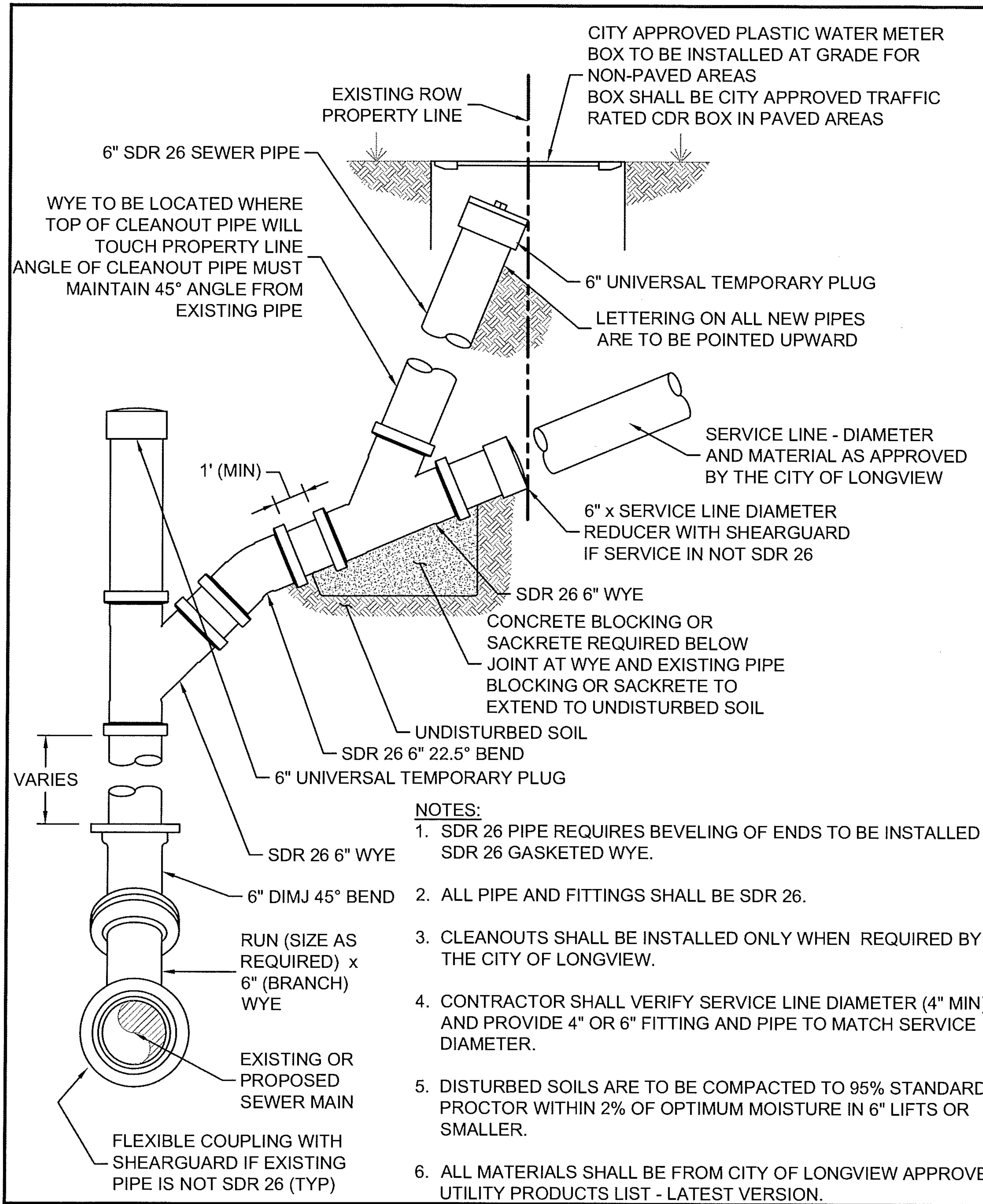
	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SANITARY SEWER LINE INSTALLATION CLASS D EMBEDMENT


CITY APPROVED PLASTIC WATER METER BOX TO BE INSTALLED AT GRADE FOR NON-PAVED AREAS BOX SHALL BE CITY APPROVED TRAFFIC RATED CDR BOX IN PAVED AREAS
6" UNIVERSAL TEMPORARY PLUG
LETTERING ON ALL NEW PIPES ARE TO BE POINTED UPWARD
6" SDR 26 SEWER PIPE
WYE TO BE LOCATED WHERE TOP OF CLEANOUT PIPE WILL TOUCH PROPERTY LINE ANGLE OF CLEANOUT PIPE MUST MAINTAIN 45° ANGLE FROM EXISTING PIPE
6" SDR 26 WYE
1' (MIN)
6" 45° BEND
SEWER MAIN SIZE x 6" WYE
EXISTING ROW
PROPERTY LINE
SEWER SERVICE LINE (DIAMETER AND MATERIAL AS APPROVED BY THE CITY OF LONGVIEW)
ECCENTRIC REDUCER FOR SERVICES LINES LESS THAN 6" DIAMETER
EXISTING OR PROPOSED SEWER MAIN
CONCRETE BLOCKING OR SACKRETE REQUIRED BELOW JOINT AT WYE AND EXISTING PIPE BLOCKING OR SACKRETE TO EXTEND TO UNDISTURBED SOIL
FLEXIBLE COUPLING WITH SHEAR RING REQUIRED IF EXISTING PIPE IS NOT SDR 26 (TYP)
UNDISTURBED SOIL

NOTES:

1. BEVEL OF ENDS OF PIPE PRIOR TO INSERTING IN FITTINGS (TYP).
2. ALL PIPE AND FITTINGS SHALL BE SDR 26.
3. CLEANOUTS SHALL BE INSTALLED AS REQUIRED BY THE CITY OF LONGVIEW.
4. SERVICE CONNECTION AT MAIN AND CLEAN OUT SHALL BE MINIMUM 6" DIAMETER FOR 4" SERVICES. FOR SERVICE LINES LARGER THAN 4" DIAMETER, SERVICE CONNECTION AT THE MAIN SHALL BE MADE AS A MANHOLE CONSTRUCTED AT THE MAIN.
5. DISTURBED SOILS SHALL BE COMPACTED TO 95% STANDARD PROCTOR WITHIN 2% OF OPTIMUM MOISTURE IN 6" LIFTS OR SMALLER.
6. PROVIDE AND INSTALL ECCENTRIC REDUCER AT BASE OF CLEANOUT RISER FOR EXISTING SERVICES LESS THAN 6" DIAMETER AND INSTALL 4" WYE IN SERVICE LINE.
7. ALL MATERIALS SHALL BE FROM THE LATEST VERSION OF THE CITY OF LONGVIEW APPROVED UTILITY PRODUCTS LISTS.

	SANITARY SEWER LATEST REVISION: 10/26/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SANITARY SEWER SERVICE


CITY APPROVED PLASTIC WATER METER BOX TO BE INSTALLED AT GRADE FOR NON-PAVED AREAS
BOX SHALL BE CITY APPROVED TRAFFIC RATED CDR BOX IN PAVED AREAS
EXISTING ROW PROPERTY LINE
6" SDR 26 SEWER PIPE
WYE TO BE LOCATED WHERE TOP OF CLEANOUT PIPE WILL TOUCH PROPERTY LINE
ANGLE OF CLEANOUT PIPE MUST MAINTAIN 45° ANGLE FROM EXISTING PIPE
6" UNIVERSAL TEMPORARY PLUG
LETTERING ON ALL NEW PIPES ARE TO BE POINTED UPWARD
SERVICE LINE - DIAMETER AND MATERIAL AS APPROVED BY THE CITY OF LONGVIEW
1' (MIN)
6" x SERVICE LINE DIAMETER REDUCER WITH SHEARGUARD IF SERVICE IN NOT SDR 26
SDR 26 6" WYE
CONCRETE BLOCKING OR SACKRETE REQUIRED BELOW JOINT AT WYE AND EXISTING PIPE
BLOCKING OR SACKRETE TO EXTEND TO UNDISTURBED SOIL
UNDISTURBED SOIL
SDR 26 6" 22.5° BEND
6" UNIVERSAL TEMPORARY PLUG
VARIES
SDR 26 6" WYE
6" DIMJ 45° BEND
RUN (SIZE AS REQUIRED) x 6" (BRANCH) WYE
EXISTING OR PROPOSED SEWER MAIN
FLEXIBLE COUPLING WITH SHEARGUARD IF EXISTING PIPE IS NOT SDR 26 (TYP)

NOTES:

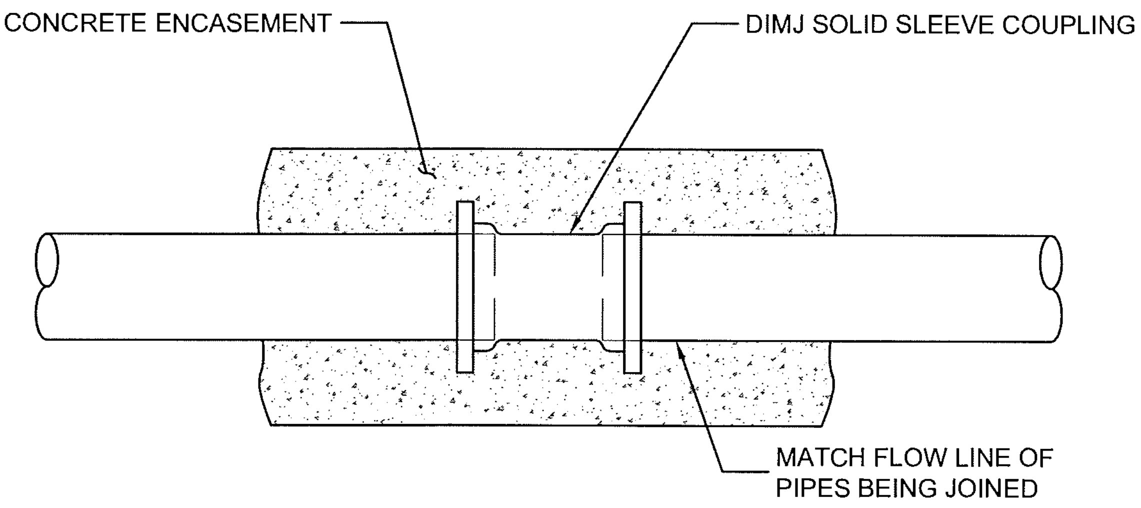
1. SDR 26 PIPE REQUIRES BEVELING OF ENDS TO BE INSTALLED IN SDR 26 GASKETED WYE.
2. ALL PIPE AND FITTINGS SHALL BE SDR 26.
3. CLEANOUTS SHALL BE INSTALLED ONLY WHEN REQUIRED BY THE CITY OF LONGVIEW.
4. CONTRACTOR SHALL VERIFY SERVICE LINE DIAMETER (4" MIN) AND PROVIDE 4" OR 6" FITTING AND PIPE TO MATCH SERVICE DIAMETER.
5. DISTURBED SOILS ARE TO BE COMPACTED TO 95% STANDARD PROCTOR WITHIN 2% OF OPTIMUM MOISTURE IN 6" LIFTS OR SMALLER.
6. ALL MATERIALS SHALL BE FROM CITY OF LONGVIEW APPROVED UTILITY PRODUCTS LIST - LATEST VERSION.

SANITARY SEWER

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

SANITARY SEWER SERVICE
FOR MAINS
7' AND DEEPER


CONCRETE ENCASEMENT
DIMJ SOLID SLEEVE COUPLING
MATCH FLOW LINE OF
PIPES BEING JOINED

NOTES:

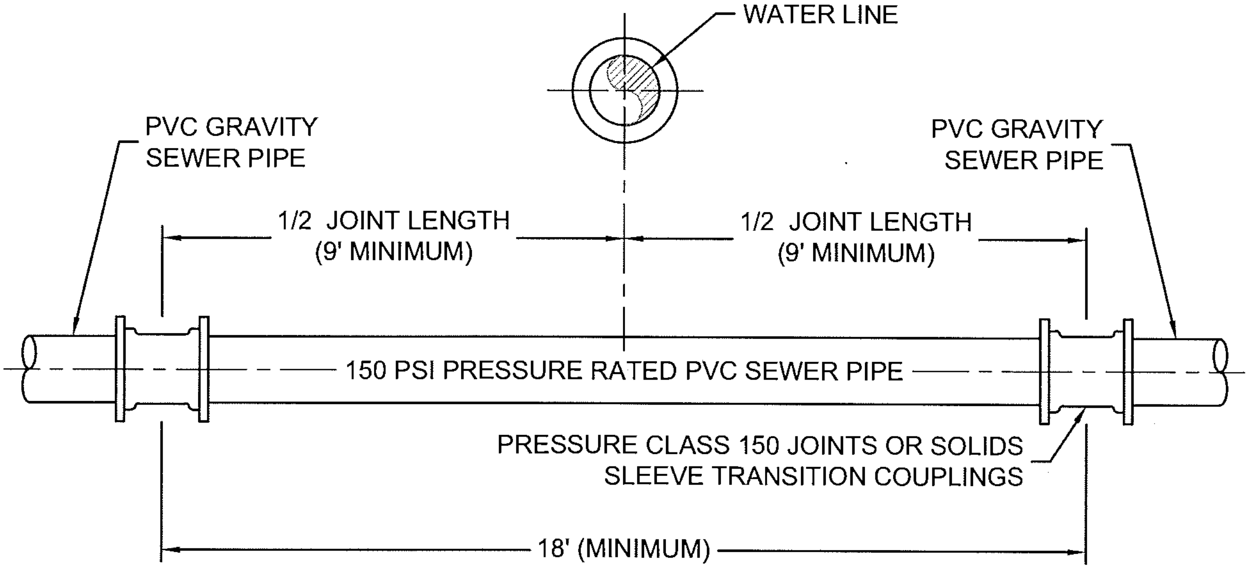
1. USE TRANSITION GASKETS BETWEEN PIPE TYPES WHEN POSSIBLE.
2. BLOCK PIPES CAREFULLY PRIOR TO CONCRETE ENCASEMENT TO ENSURE ACCURATE PIPE ALIGNMENT.
3. COMPLETED JOINT MUST BE ABLE TO PASS MANDREL TESTING.

SANITARY
SEWER

LATEST
REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

SEWER LINE
TRANSITION COUPLING


WATER LINE
PVC GRAVITY SEWER PIPE
PVC GRAVITY SEWER PIPE
1/2 JOINT LENGTH (9' MINIMUM)
1/2 JOINT LENGTH (9' MINIMUM)
150 PSI PRESSURE RATED PVC SEWER PIPE
PRESSURE CLASS 150 JOINTS OR SOLIDS SLEEVE TRANSITION COUPLINGS
18' (MINIMUM)

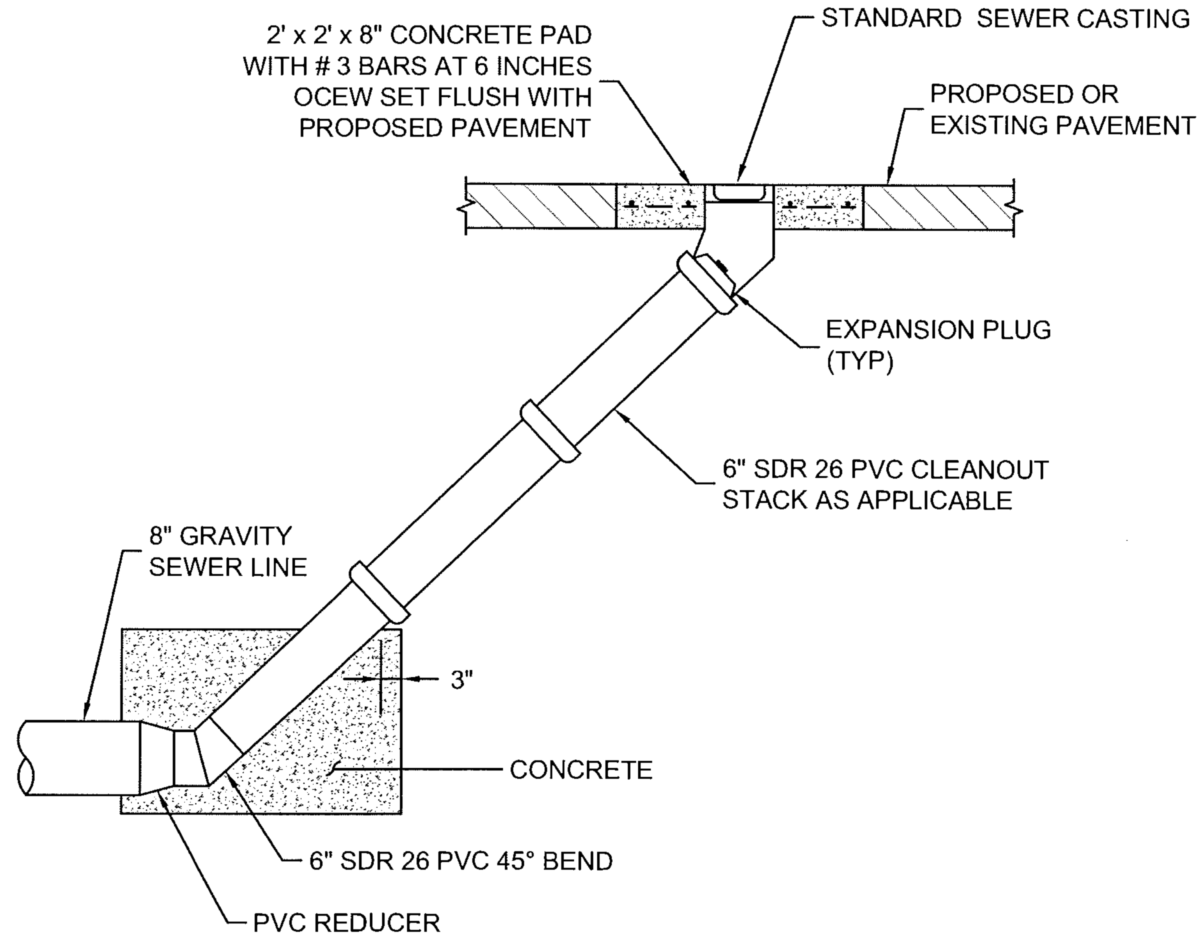
NOTES:

1. FOR NEW WATER/SEWER INSTALLATION, THE WATERLINE SHALL BE LOCATED ABOVE THE SEWER LINE.

2. CROSSING PIPES WITHIN 9 FEET, WHERE THE COLLECTION PIPE IS BELOW THE WATERLINE, CONSTRUCT THE COLLECTION LINE USING THE FOLLOWING:
   a. 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG WITH JOINT CENTERED ON THE CROSSING.
   b. AT LEAST 6" OF VERTICAL SEPARATION.
   c. TERMINATING JOINTS DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE.

3. FOR NEW WATERLINE CROSSING EXISTING SEWER, REMOVE EXISTING SEWER LINE AND REPLACE WITH A FULL JOINT OF 150 PSI OR GREATER PRESSURE RATED PVC PIPE. CENTER JOINT AT WATERLINE CROSSING. INSTALL PRESSURE RATED TRANSITIONS.

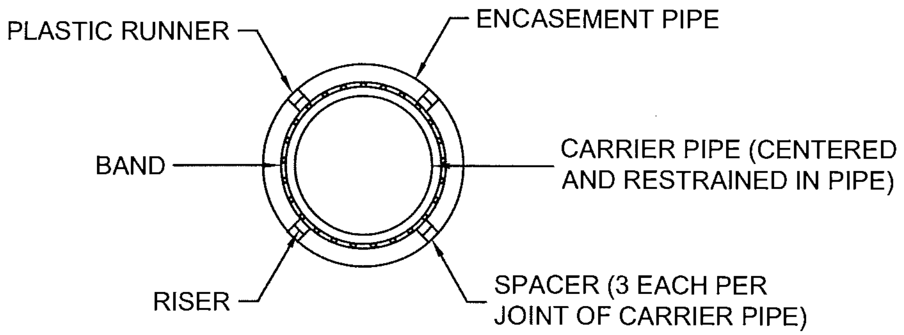
	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER - WATER CROSSING


2' x 2' x 8" CONCRETE PAD WITH # 3 BARS AT 6 INCHES OCEW SET FLUSH WITH PROPOSED PAVEMENT
STANDARD SEWER CASTING
PROPOSED OR EXISTING PAVEMENT
EXPANSION PLUG (TYP)
6" SDR 26 PVC CLEANOUT STACK AS APPLICABLE
8" GRAVITY SEWER LINE
3"
CONCRETE
6" SDR 26 PVC 45° BEND
PVC REDUCER

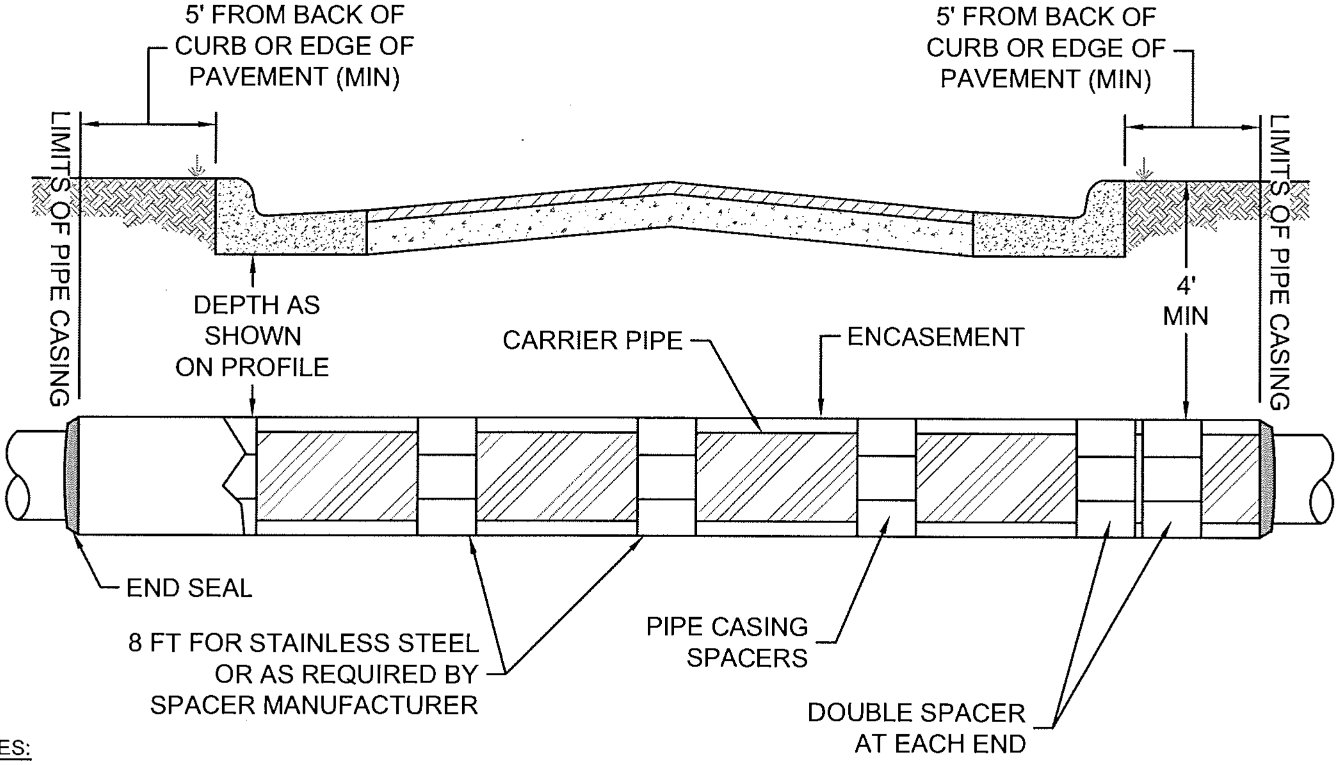
NOTE:

1. ALL PIPE AND FITTINGS SHALL BE SDR 26 PVC UNLESS OTHERWISE NOTED.
2. AT UNPAVED AREAS, TERMINATE IN CITY OF LONGVIEW APPROVED PLASTIC METER BOX. INSTALL LEVEL WITH ADJACENT FINISHED GRADE.
3. CONCRETE PAD SHALL BE A MINIMUM OF 8" THICK OR THICKNESS OF CONCRETE PAVEMENT.
4. IN PAVED AREAS, BACKFILL CLEANOUT USING SELECT FILL (SOIL TYPE S3) OR CITY OF LONGVIEW APPROVED EQUAL.
5. COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR WITHIN 2% OF OPTIMUM MOISTURE IN 6" LIFTS.

	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER MAIN CLEANOUT


PLASTIC RUNNER
ENCASEMENT PIPE
BAND
CARRIER PIPE (CENTERED AND RESTRAINED IN PIPE)
RISER
SPACER (3 EACH PER JOINT OF CARRIER PIPE)

PIPE CASING SPACER


5' FROM BACK OF CURB OR EDGE OF PAVEMENT (MIN)
5' FROM BACK OF CURB OR EDGE OF PAVEMENT (MIN)
LIMITS OF PIPE CASING
LIMITS OF PIPE CASING
DEPTH AS SHOWN ON PROFILE
CARRIER PIPE
ENCASEMENT
4' MIN
END SEAL
8 FT FOR STAINLESS STEEL OR AS REQUIRED BY SPACER MANUFACTURER
PIPE CASING SPACERS
DOUBLE SPACER AT EACH END

NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO PIPE CASING DETAIL NOTES AND SPECIFICATIONS.
2. CASING SPACERS SHALL BE STAINLESS STEEL.
3. CASING SPACERS SHALL CENTER AND RESTRAIN CARRIER PIPE IN CASING.
4. CASING END SEALS SHALL BE "PULLON" TYPE, "WRAP AROUND" END SEALS ARE PROHIBITED.
5. FOR NEW ROAD CONSTRUCTION, INSTALL CASING BY OPEN CUT PRIOR TO ROAD CONSTRUCTION. INSTALL CLASS C PIPE EMBEDMENT AND BACKFILL CASING TRENCH PER CLASS C EMBEDMENT DETAIL.
6. FOR CONSTRUCTION AT EXISTING ROADS, INSTALL BE DRY BORE UNLESS APPROVED OTHERWISE BY THE CITY OF LONGVIEW.
7. LATERAL AND VERTICAL VARIATION IN THE FINAL POSITION OF THE PIPE CASING OR TUNNEL LINER FROM THE LINE AND GRADE ESTABLISHED BY THE CITY OF LONGVIEW SHALL BE ACCEPTABLE ONLY TO THE EXTENT THAT IT DOES NOT IMPACT THE LINE AND GRADE OF THE CARRIER PIPE. IF IN THE CITY OF LONGVIEW'S OPINION, THE COMPLETED INSTALLATION DOES NOT MEET THE INTENT OF THE DESIGN, THE WORK SHALL NOT BE CONSIDERED ACCEPTABLE AND SHALL BE REPLACED.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 1 OF 4
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PIPE CASING DETAIL NOTES:

MATERIALS:

A. STEEL PIPE:

1. STEEL CASING PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
2. STEEL CASING PIPE TO BE INSTALLED WITH UNION PACIFIC RAILROAD RIGHT-OF-WAY SHALL BE COATED WITH COAL TAR EPOXY MEETING THE REQUIREMENTS OF CORP OF ENGINEERS SPECIFICATIONS C-200A. COAL TAR EPOXY SHALL BE INSTALLED IN TWO COATS FOR A TOTAL DFT OF 16 MILS. WELDED JOINTS SHALL BE FIELD COATED. ALL OTHER CASING INSTALLED OUTSIDE OF UNION PACIFIC RAILROAD RIGHT-OF-WAY MAY BE UNCOATED.
3. CASING SHALL MEET ASTM A-36, ASTM A-570, ASTM A-135, ASTM A-139, OR CITY OF LONGVIEW APPROVED EQUAL.
4. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA C-206.
5. UNLESS SPECIFIED OTHERWISE, THE MINIMUM WALL THICKNESS OF STEEL CASING PIPE SHALL BE AS FOLLOWS:

CASING DIAMETER	WALL THICKNESS
<12"	0.25"
13" - 18"	0.25"
19" - 22"	0.25"
23" - 28"	0.4375"
29" - 34"	0.50"
35" - 42"	0.5625"
43" - 48"	0.625"

B. CASING INSULATORS:

1. USE CASING INSULATORS FOR ALL TYPES OF CARRIER PIPE.
2. INSULATORS SHALL CONSIST OF PRE-MANUFACTURED STEEL BANDS WITH PLASTIC LINING AND PLASTIC RUNNERS.
3. INSULATORS SHALL FIT SNUG OVER THE CARRIER PIPE AND POSITION THE CARRIER PIPE APPROXIMATELY IN THE CENTER OF THE CASING PIPE, TO PROVIDE ADEQUATE CLEARANCE BETWEEN THE CARRIER PIPE BELL AND THE CASING PIPE.
4. FASTENERS FOR INSULATORS SHALL BE STAINLESS STEEL.
5. INSULATORS SHALL BE AS MANUFACTURED BY ADVANCE PRODUCT AND SYSTEMS, INC., MODEL #SSI, OR CITY OF LONGVIEW APPROVED EQUAL.

C. END SEALS:

1. ALL CASINGS SHALL BE SEALED.
2. SEALS SHALL BE ONE-PIECE RUBBER WITH STAINLESS STEEL BANDS.
3. END SEALS SHALL BE MOLDED TO FIX THE CASING PIPE AND CARRIER PIPE.
4. ADVANCED PRODUCT AND SYSTEMS, MODEL #AC OR CITY OF LONGVIEW APPROVED EQUAL.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 2 OF 4
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CROSSINGS INSTALLED BY BORING NOTES:

A. PERFORM THE BORING FROM THE LOW OR DOWNSTREAM END UNLESS SPECIFIED OTHERWISE.

1. THE CASING BORE SHALL BE DONE BY AUGER TYPE BORING METHOD. THE CASING BORE SHALL NOT BE DONE BY DIRECTIONAL DRILLING UNLESS APPROVED BY THE CITY OF LONGVIEW PRIOR TO BIDDING.

2. PLACE EXCAVATED MATERIAL NEAR THE TOP OF THE WORKING PIT AND DISPOSE OF MATERIAL AS REQUIRED.

3. JETTING SHALL NOT BE PERMITTED.

B. IN UNCONSOLIDATED SOIL FORMATIONS, A GEL-FORMING COLLOIDAL DRILLING FLUID CONSISTING OF AT LEAST 10% OF HIGH GRADE CAREFULLY PROCESSED BENTONITE MAY BE USED TO CONSOLIDATE CUTTING OF THE BIT, SEAL THE WALLS OF THE HOLE, AND FURNISH LUBRICATION FOR SUBSEQUENT REMOVAL OF CUTTING AND INSTALLATION OF THE PIPE IMMEDIATELY THEREAFTER.

C. IN LOCATIONS WHERE THE SOIL FORMATION IS OTHER THAN CONSOLIDATED ROCK, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION.

1. THIS REQUIREMENT APPLIES TO ALL BORED HOLES OF 18" OR GREATER IN DIAMETER.

2. FOR SMALLER DIAMETER BORED HOLES, IT IS DESIRABLE THAT THE CASING BE INSTALLED AS THE BORING PROGRESSES, BUT BECAUSE OF DIFFERENCES IN SOIL FORMATIONS, THE TIME FOR INSERTING THE CASING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

3. IN THE EVENT THAT CAVING SAND OR WATER BEARING MATERIALS ARE ENCOUNTERED, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION REGARDLESS OF THE DIAMETER OF THE BORED HOLE.

4. IN ALL CASES, THE SECURITY AND INTEGRITY OF THE ROADWAY IS THE PRIMARY CONCERN.

5. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR CONTINUED INTEGRITY OF THE STRUCTURE OF THE ROADWAY BEING CROSSED, WHETHER OR NOT A CASING PIPE IS INSERTED SIMULTANEOUSLY WITH THE BORING OPERATION.

CROSSING INSTALLED BY TUNNELING AND JACKING:

A. JACK THE PIPE FROM THE LOW OR DOWNSTREAM END, UNLESS SPECIFIED OTHERWISE.

1. PROVIDE HEAVY-DUTY JACKS SUITABLE FOR FORCING THE PIPE THROUGH THE EMBANKMENT.

2. IN OPERATING JACKS, APPLY EVEN PRESSURE TO THE JACKS USED.

3. PROVIDE A SUITABLE JACKING HEAD AND BRACING BETWEEN JACKS SO THAT PRESSURE WILL BE APPLIED AT THE PIPE IN UNIFORMLY AROUND THE RIND OF THE PIPE.

4. PROVIDE A SUITABLE JACKING FRAME OR BACKSTOP.

5. SET THE PIPE TO BE JACKED ON GUIDES, PROPERLY BRACED TOGETHER, TO SUPPORT THE SECTION OF THE PIPE AND TO DIRECT IT IN THE PROPER LINE AND GRADE.

6. PLACE THE WHOLE JACKING ASSEMBLY SO AS TO LINE UP WITH THE DIRECTION AND GRADE OF THE PIPE.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 3 OF 4
	LATEST REVISION: 3/21/2018		

    7. IN GENERAL, EXCAVATE EMBANKMENT MATERIAL JUST AHEAD OF THE PIPE AND MATERIAL REMOVED THROUGH THE PIPE.

    8. FORCE THE PIPE THROUGH THE EMBANKMENT WITH JACKS INTO THE SPACE PROVIDED.

B. THE EXCAVATION FOR THE UNDERSIDE OF THE PIPE, FOR AL LEAST 1/3 OF THE CIRCUMFERENCE OF THE PIPE, SHALL CONFORM TO THE CONTOUR AND GRADE OF THE PIPE.

    1. PROVIDE A CLEARANCE OF NOT MORE THAN 2" FOR THE UPPER HALF OF THE PIPE.

    2. THIS CLEARANCE SHALL BE TAPERED OFF TO ZERO AT THE POINT WHERE EXCAVATION CONFORMS TO THE CONTOUR OF THE PIPE.

    3. EXTEND THE DISTANCE OF THE EXCAVATION BEYOND THE END OF THE PIPE DEPENDING ON THE CHARACTER OF THE MATERIAL, BUT DO NOT EXCEED 2' IN ANY CASE.

    4. DECREASE THE DISTANCE IF THE CHARACTER OF THE MATERIAL BEING EXCAVATED MAKES IT DESIRABLE TO KEEP THE ADVANCE EXCAVATION CLOSER TO THE END OF THE PIPE.

C. IF DESIRED, USE A CUTTING EDGE OF STEEL PLATE AROUND THE HEAD END OF THE PIPE EXTENDING A SHORT DISTANCE BEYOND THE END OF THE PIPE WITH INSIDE ANGLES OR LUGS TO KEEP CUTTING EDGE FROM SLIPPING BACK ONTO PIPE.

D. WHEN JACKING OF PIPE HAS BEGUN, CARRY ON THE OPERATION WITHOUT INTERRUPTION TO PREVENT THE PIPE FROM BECOMING FIRMLY SET IN THE EMBANKMENT.

    1. REMOVE AND REPLACE ANY PIPE DAMAGED IN THE JACKING OPERATIONS.

    2. THE CONTRACTOR SHALL ABSORB THE ENTIRE EXPENSE.

CROSSING WITH CASING INSTALLED BY OPEN CUT:

A. THIS ARTICLE COVERS THE REQUIREMENTS FOR THE CONSTRUCTION OF CROSSING WHERE PIPE CASING IS REQUIRED FOR INSTALLATION BY THE OPEN CUT METHOD.

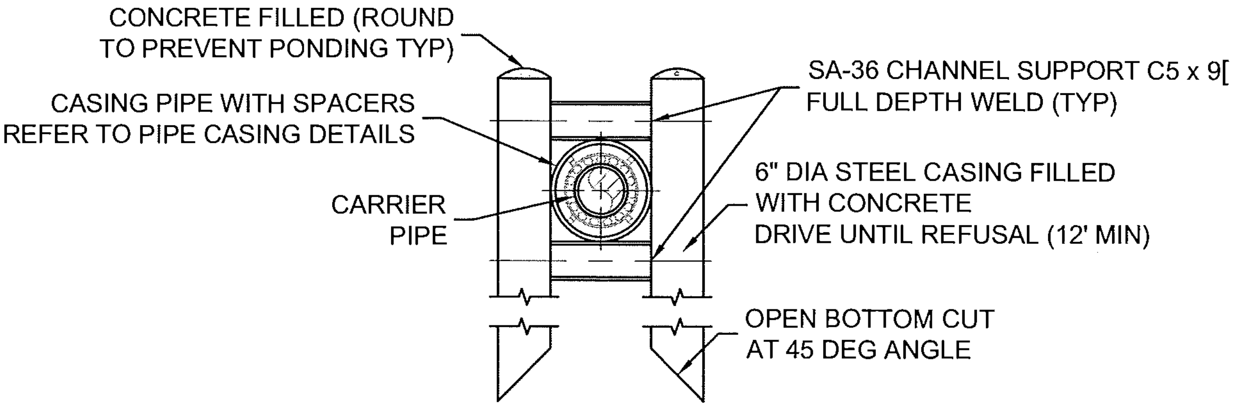
B. EXCAVATION, BACKFILL, AND EMBANKMENT OF CASING PIPE SHALL BE AS SPECIFIED.

C. CASING SHALL BE BEDDED IN GRAVEL MATERIAL TO THE SPRINGLINE OF THE CASING.

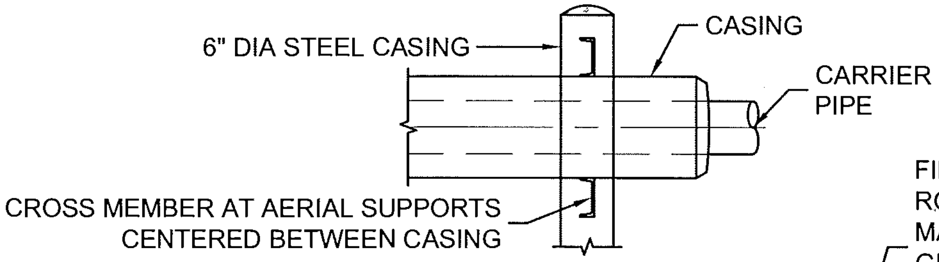
D. CONTRACTOR SHALL BACKFILL WITH SELECT FILL MATERIAL COMPACTED IN 8-INCH LIFTS.

E. CONTRACTOR SHALL COMPLETE THE BACKFILL AND REPAIR THE PAVEMENT SECTION AS SHOWN.

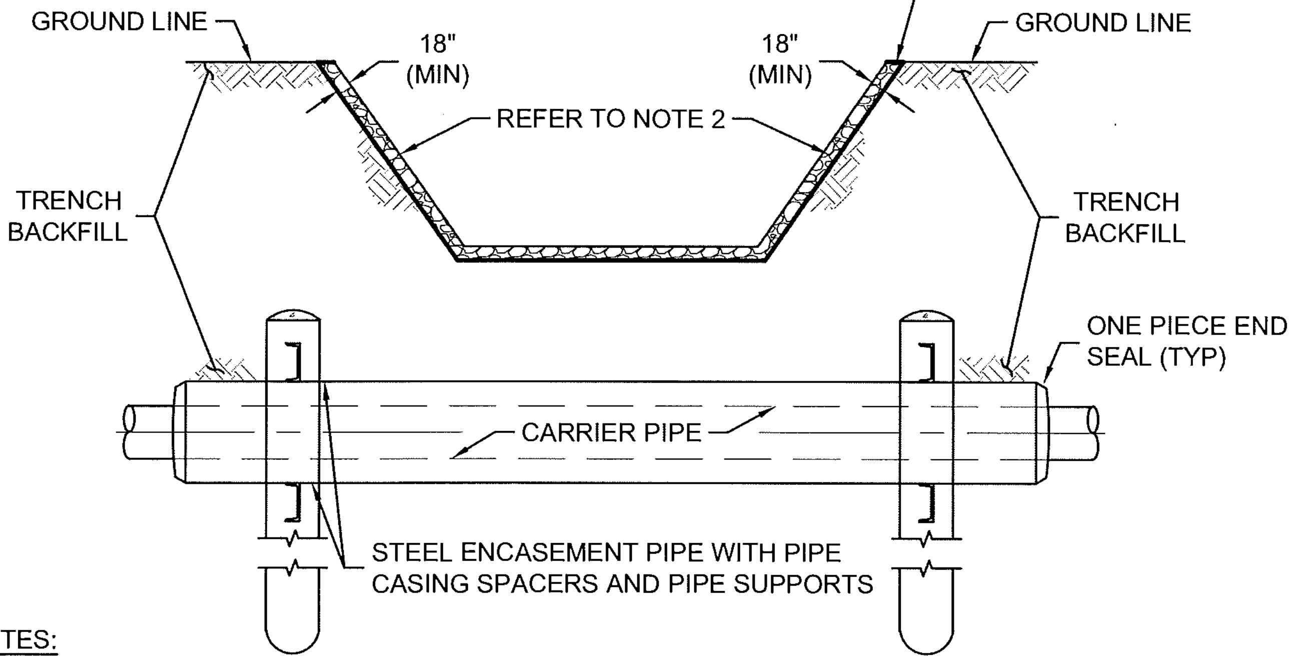
F. IF SETTLEMENT OCCURS, THE PAVEMENTS SHALL BE REMOVED AND THE TRENCH RECOMPACTED AS THE CONTRACTOR'S EXPENSE.


CONCRETE FILLED (ROUND
TO PREVENT PONDING TYP)
CASING PIPE WITH SPACERS
REFER TO PIPE CASING DETAILS
CARRIER
PIPE
SA-36 CHANNEL SUPPORT C5 x 9[
FULL DEPTH WELD (TYP)
6" DIA STEEL CASING FILLED
WITH CONCRETE
DRIVE UNTIL REFUSAL (12' MIN)
OPEN BOTTOM CUT
AT 45 DEG ANGLE

PIPE SUPPORT


6" DIA STEEL CASING
CASING
CARRIER
PIPE
CROSS MEMBER AT AERIAL SUPPORTS
CENTERED BETWEEN CASING

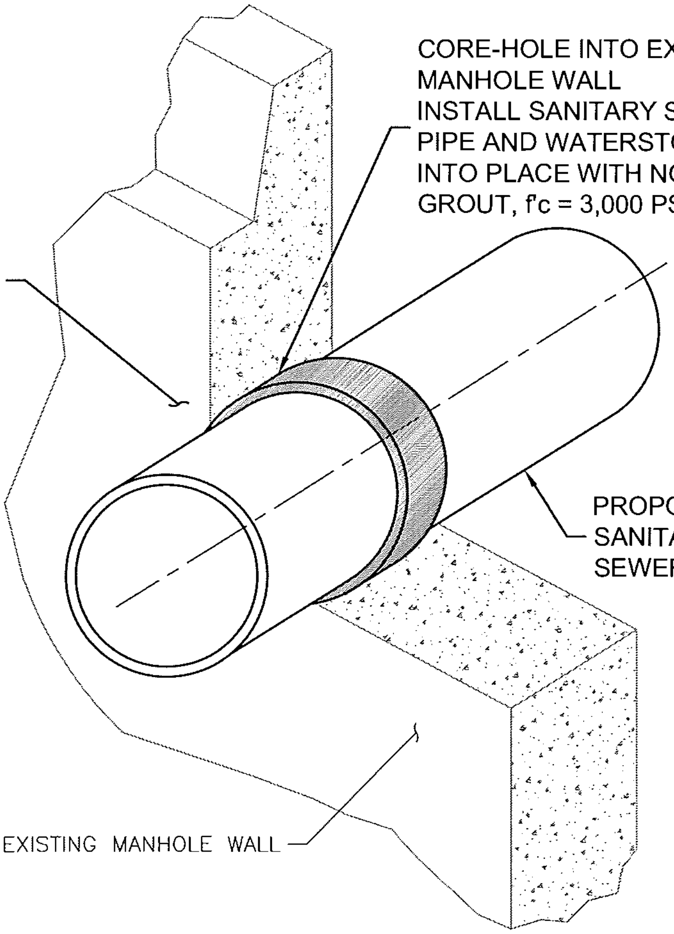
SIDE VIEW PIPE SUPPORT


FINISHED SURFACE OF
ROCK RIPRAP SHALL
MATCH LEVELS AND
GRADES OF
PRECONSTRUCTION
CONTOURS
GROUND LINE
18"
(MIN)
18"
(MIN)
GROUND LINE
REFER TO NOTE 2
TRENCH
BACKFILL
TRENCH
BACKFILL
ONE PIECE END
SEAL (TYP)
CARRIER PIPE
STEEL ENCASEMENT PIPE WITH PIPE
CASING SPACERS AND PIPE SUPPORTS

NOTES:

1. REFER TO PIPE CASING DETAILS FOR CASING SIZE/MATERIAL, SPACERS, AND END SEALS.
2. INSTALL MIRAFI 700X FILTER FABRIC, OR EQUIVALENT UNDER AND ON SIDES OF PROPOSED STONES. SECURE WITH 9" LONG U-PINS @ 4' OCEW.
3. ROCK RIPRAP - TxDOT ITEM 432, TYPE R MODIFIED TO HAVE ALL STONES BETWEEN 50 AND 150 LBS, AND AT LEAST 50% OF THE STONES GREATER THAN 100 LBS.
4. INSTALL RIPRAP TO OUTSIDE OF TRENCH WIDTH PLUS 3' EITHER SIDE OF TRENCH EXCAVATION.

	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER LINE CREEK CROSSING



AS AN OPTION TO CORING WALL, SCORE OUTSIDE OF EXISTING MANHOLE WALL WITH CONCRETE SAW. CHIP OPENING IN MANHOLE. PROTECT EXISTING REINFORCEMENT. INSTALL SANITARY SEWER PIPE WITH WATERSTOP. GROUT INTO PLACE WITH NON-SHRINK GROUT, f'c = 3,000 PSI.

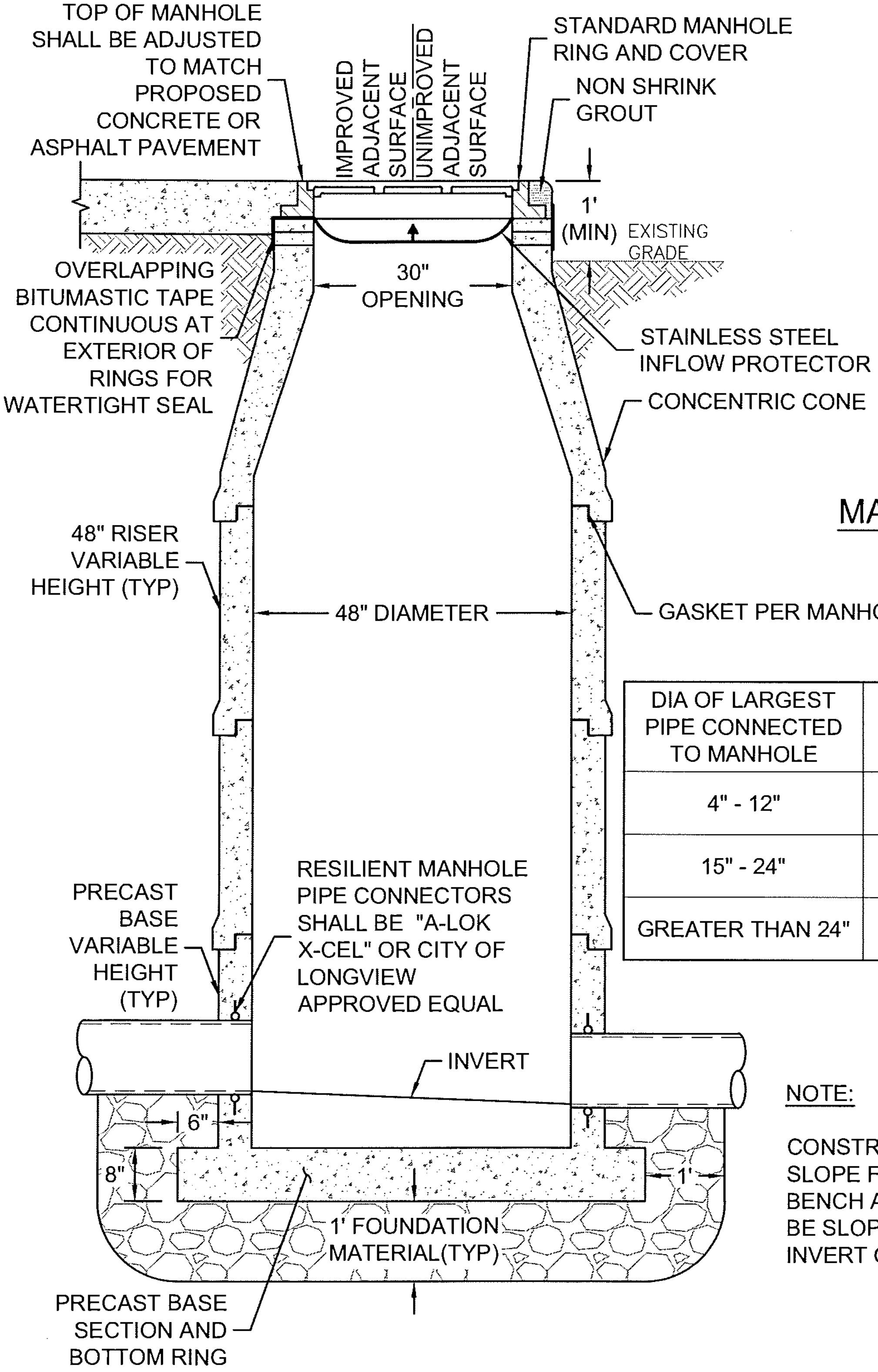
CORE-HOLE INTO EXISTING MANHOLE WALL
INSTALL SANITARY SEWER PIPE AND WATERSTOP. GROUT INTO PLACE WITH NON-SHRINK GROUT, f'c = 3,000 PSI.

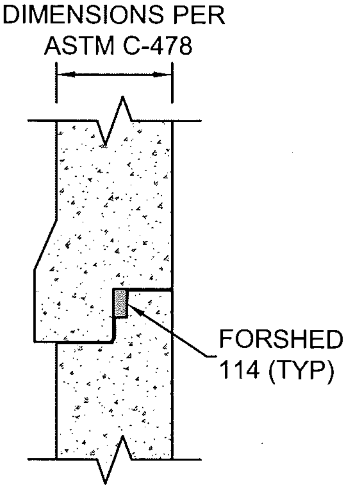
PROPOSED SANITARY SEWER PIPE

NOTES:

1. PIPE ENTRANCE SHALL BE ADJUSTED TO AVOID CONNECTION AT MANHOLE JOINTS.
2. USE SINGLE CLAMP WATERSTOP CONNECTOR FOR SMOOTH WALL PIPES. WATERSTOP SHALL BE A-LOK WATER-STOP CONNECTOR MEETING ASTM C-923, C-144, AND C-1478 OR CITY OF LONGVIEW APPROVED EQUAL.
3. IF MANHOLE REINFORCEMENT IS DAMAGED DURING SCORING OR CHIPPING OR IF OPENING IS MORE THAN 5" LARGER THAN PIPE OD, INSTALL #3 REBAR AT 6" OCEW PRIOR TO GROUTING WITH NON-SHRINK GROUT. REBAR INSTALLATION SHALL BE APPROVED BY CITY OF LONGVIEW.
4. IF CONNECTION TO THE MANHOLE IS BELOW EXISTING CONCRETE FILL, REMOVE EXISTING MANHOLE CONCRETE CHANNEL. AFTER CONNECTIONS ARE COMPLETE INSTALL NEW CONCRETE INVERT CHANNEL PER TCEQ 217.55.(k)(2) WITH CITY OF LONGVIEW APPROVED CONCRETE MIX (f'c = 3,000 PSI).
5. IF CONNECTION TO MANHOLE IS GREATER THAN 24" ABOVE THE MANHOLE INVERT, A DROP CONNECTION SHALL BE INSTALLED. THE DROP CONNECTION SHALL BE MADE IN THE SAME MANNER AS DESCRIBED IN THESE NOTES FOR THE TIE - IN.

	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	TIE - IN TO EXISTING MANHOLE


TOP OF MANHOLE SHALL BE ADJUSTED TO MATCH PROPOSED CONCRETE OR ASPHALT PAVEMENT
IMPROVED ADJACENT SURFACE
UNIMPROVED ADJACENT SURFACE
STANDARD MANHOLE RING AND COVER
NON SHRINK GROUT
1' (MIN)
EXISTING GRADE
OVERLAPPING BITUMASTIC TAPE CONTINUOUS AT EXTERIOR OF RINGS FOR WATERTIGHT SEAL
30" OPENING
STAINLESS STEEL INFLOW PROTECTOR
CONCENTRIC CONE
48" RISER VARIABLE HEIGHT (TYP)
48" DIAMETER
GASKET PER MANHOLE JOINT DETAIL (TYP)
PRECAST BASE VARIABLE HEIGHT (TYP)
RESILIENT MANHOLE PIPE CONNECTORS SHALL BE "A-LOK X-CEL" OR CITY OF LONGVIEW APPROVED EQUAL
INVERT
6"
8"
1'
1' FOUNDATION MATERIAL(TYP)
PRECAST BASE SECTION AND BOTTOM RING


DIMENSIONS PER ASTM C-478
FORSHEDA 114 (TYP)

MANHOLE JOINT DETAIL

DIA OF LARGEST PIPE CONNECTED TO MANHOLE	DEPTH OF MANHOLE CHANNEL
4" - 12"	EQUAL TO 1/2 DIA OF LARGEST PIPE
15" - 24"	EQUAL TO 3/4 DIA OF LARGEST PIPE
GREATER THAN 24"	EQUAL TO DIA OF LARGEST PIPE

NOTE:

CONSTRUCT INVERT ON EVEN SLOPE FROM PIPE TO PIPE. THE BENCH ABOVE THE CHANNEL SHALL BE SLOPED AT 1/2 INCH PER FOOT. INVERT GROUT f'c = 3,000 PSI

SANITARY SEWER

LATEST REVISION:
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CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

SANITARY SEWER MANHOLE

CONCRETE MANHOLE GENERAL NOTES:

1. PRECAST RISERS, CONES, FLOORS, GRADE RINGS, AND RINGS AND COVERS SHALL BE MANUFACTURED ACCORDING TO THE MOST RECENT ASTM C-478 SPECIFICATIONS.

2. ALL MANHOLE CONSTRUCTION SHALL BE WATERTIGHT. JOINTS SHALL BE RUBBER GASKET MANHOLE SECTIONS WITH PROFILE JOINT AND FORSHEDA 114 JOINT SEALS OR APPROVED EQUAL.

3. ANY ERECTION HOLES, STEP HOLES, OR OTHER HOLES THROUGH THE WALL OF THE MANHOLE SHALL BE COVERED WITH 3" NON-SHRINK CONCRETE GROUT.

4. GRADE RINGS SHALL BE FORMED WITH TONGUE AND GROOVE OF LUGS AND NOTCHES. GRADE RINGS SHALL BE SET IN MORTAR OR PLASTIC JOINT COMPOUND.

5. WHEN FIELD CONDITIONS REQUIRE HEIGHT TO BE ADJUSTED, ADDITIONAL GRADE RINGS MAY BE USED AS DIRECTED BY THE CITY OF LONGVIEW. INSTALL BITUMASTIC TAPE CONTINUOUS AT EXTERIOR OF GRADE RINGS AND COVER OVERLAPPING JOINTS FOR WATERTIGHT SEAL.

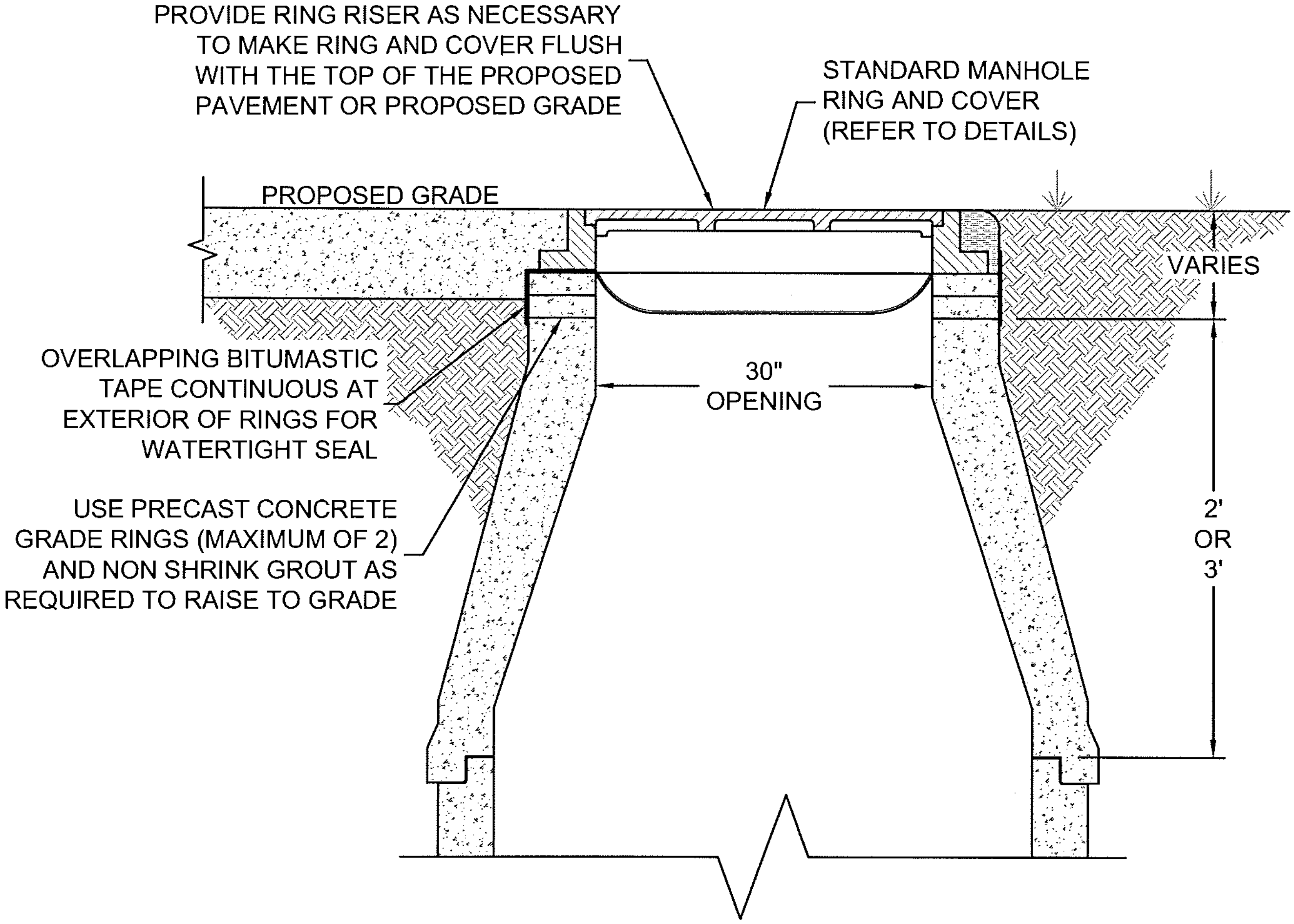
6. WHENEVER THE SUBGRADE FOR ANY MANHOLE OR DROP MANHOLE IS OF AN UNSATISFACTORY MATERIAL, SAME SHALL BE REMOVED AND REPLACED WITH A CRUSHED ROCK FOUNDATION AND COMPACTED TO THE SATISFACTION OF THE CITY OF LONGVIEW.

7. ALL CONCRETE ENCASEMENT IN ROCK SHALL BE POURED AGAINST THE FACE OF THE ROCK. NO PAYMENT WILL BE MADE FOR EXTRA CONCRETE USED IN OVER BREAKAGE OF THE DIMENSIONS AS SHOWN ON THE TYPICAL SECTION OF CONCRETE ENCASEMENT.

8. WHENEVER SEWER PIPE IS CONNECTED INTO THE WALL OF A MANHOLE WITHOUT A RESILIENT MANHOLE PIPE CONNECTOR THE FIRST JOINT OF THE SEWER PIPE SHALL BE LOCATED A MAXIMUM OF 12" OUTSIDE THE WALL OF THE MANHOLE. CONNECTION INTO A MANHOLE WITHOUT A RESILIENT CONNECTOR WILL BE USED ONLY WITH APPROVAL OF THE CITY OF LONGVIEW.

9. BACKFILL EXCAVATION WITH SELECT FILL COMPACTED IN 8" LAYERS TO 95% OF MAXIMUM DENSITY WITHIN 2% OF OPTIMUM MOISTURE AS DETERMINED BY ASTM D-698.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SANITARY SEWER MANHOLE NOTES
	LATEST REVISION: 3/21/2018		


PROVIDE RING RISER AS NECESSARY TO MAKE RING AND COVER FLUSH WITH THE TOP OF THE PROPOSED PAVEMENT OR PROPOSED GRADE
STANDARD MANHOLE RING AND COVER (REFER TO DETAILS)
PROPOSED GRADE
VARIES
OVERLAPPING BITUMASTIC TAPE CONTINUOUS AT EXTERIOR OF RINGS FOR WATERTIGHT SEAL
30" OPENING
USE PRECAST CONCRETE GRADE RINGS (MAXIMUM OF 2) AND NON SHRINK GROUT AS REQUIRED TO RAISE TO GRADE
2' OR 3'

SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER MANHOLE FINISHED GRADE ADJUSTMENT

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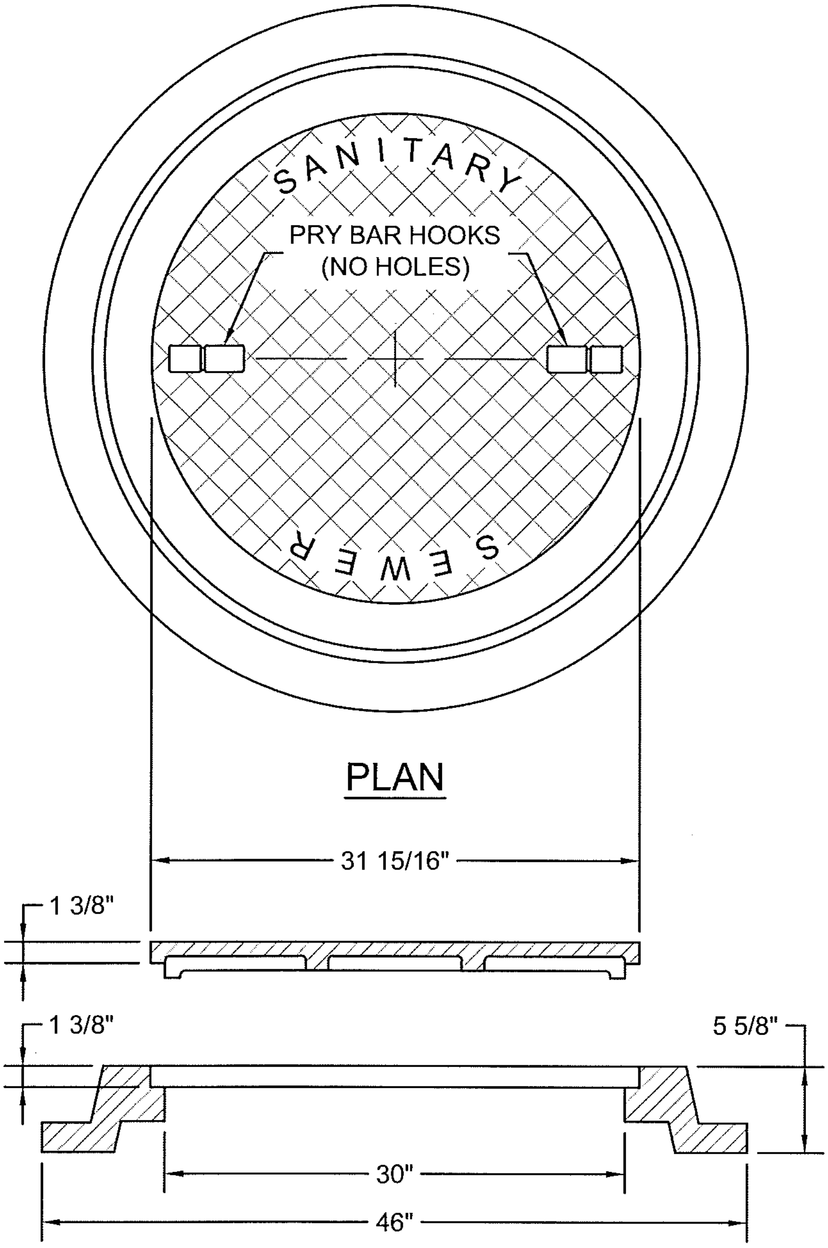
SANITARY
PRY BAR HOOKS (NO HOLES)
SEWER
PLAN
31 15/16"
1 3/8"
1 3/8"
5 5/8"
30"
46"
SECTION

NOTE:

1. FRAME AND COVER TO BE MACHINED SURFACE CAST IRON NON-ROCKING TYPE, WITH NO HOLES.

2. ASTM A48, CLASS 30B CAST IRON CONSTRUCTION, MACHINED FLAT BEARING SURFACE, AND REMOVABLE.

3. LID DESIGN; LIVE LOAD RATING OF 20,000 PSI, SEALING GASKET, AND MOLDED WITH "SANITARY SEWER" MARKED ON LID.

4. THE RING AND LID SHALL WEIGH A MINIMUM OF 210 LBS.

	SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	STANDARD SEWER MANHOLE RING AND COVER
	LATEST REVISION: 3/21/2018		

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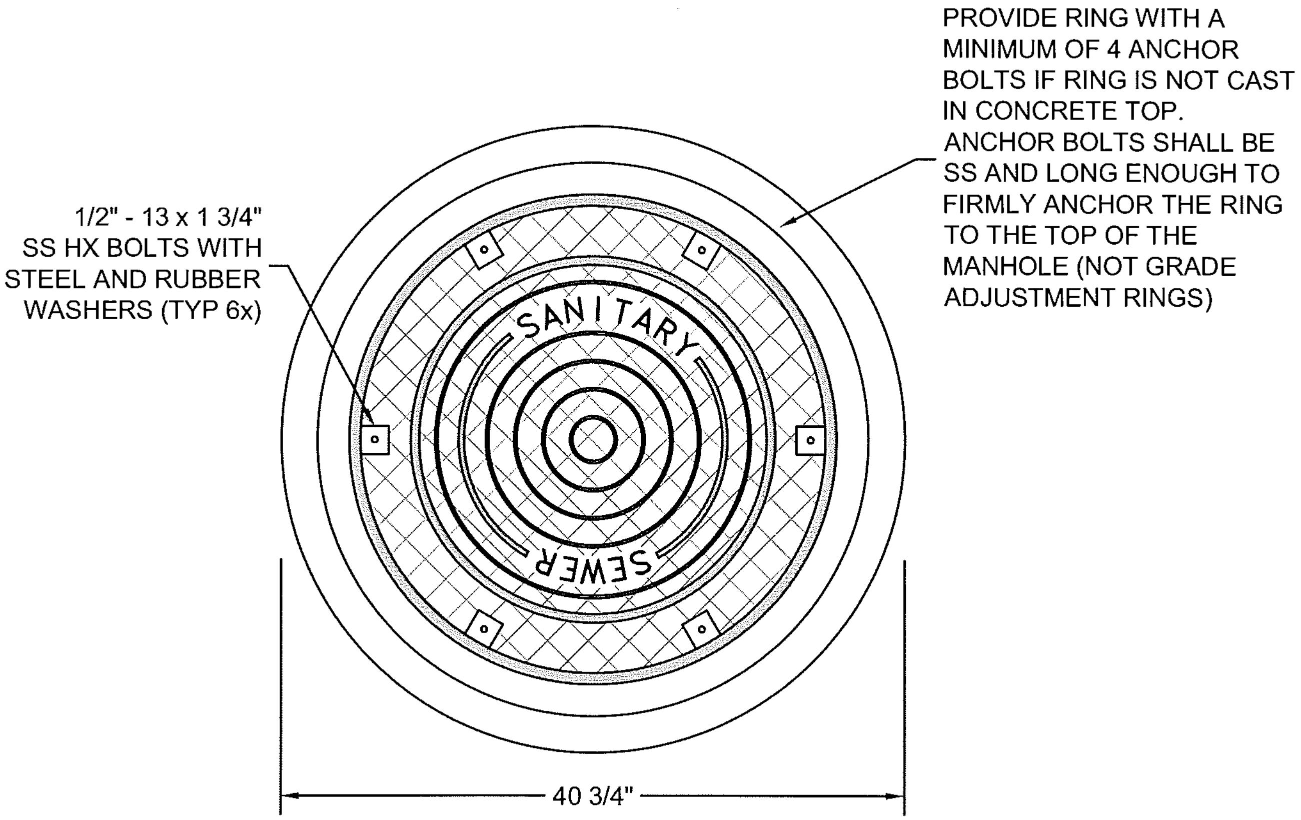
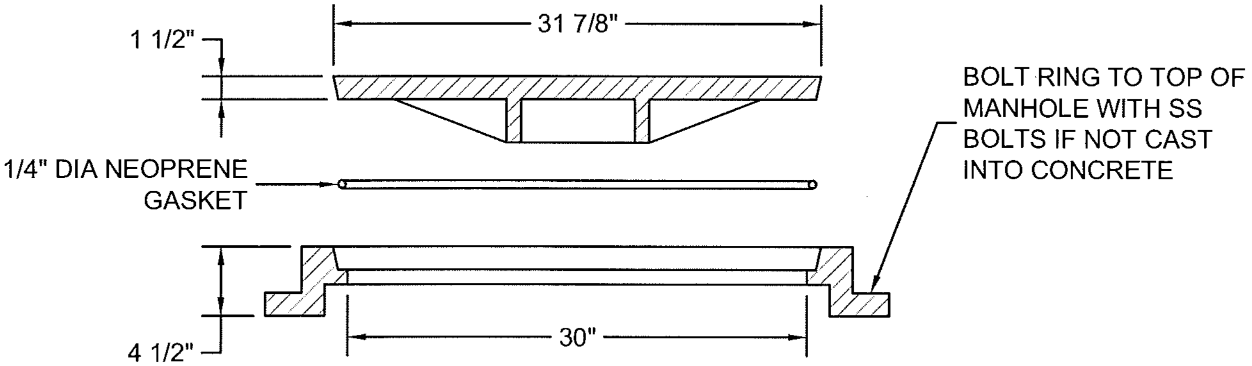


1/2" - 13 x 1 3/4" SS HX BOLTS WITH STEEL AND RUBBER WASHERS (TYP 6x)

PROVIDE RING WITH A MINIMUM OF 4 ANCHOR BOLTS IF RING IS NOT CAST IN CONCRETE TOP. ANCHOR BOLTS SHALL BE SS AND LONG ENOUGH TO FIRMLY ANCHOR THE RING TO THE TOP OF THE MANHOLE (NOT GRADE ADJUSTMENT RINGS)

PLAN



1/4" DIA NEOPRENE GASKET

BOLT RING TO TOP OF MANHOLE WITH SS BOLTS IF NOT CAST INTO CONCRETE

SECTION

NOTES:

1. ASTM A48, CLASS 30B CAST IRON CONSTRUCTION, MACHINED FLAT BEARING SURFACE, REMOVABLE, WATERTIGHT LID WHERE REQUIRED BY THE CITY OF LONGVIEW.

2. LID DESIGN; LIVE LOAD RATING OF 20,000 PSI, SEALING GASKET, AND MOLDED WITH "SANITARY SEWER" ON THE LID.

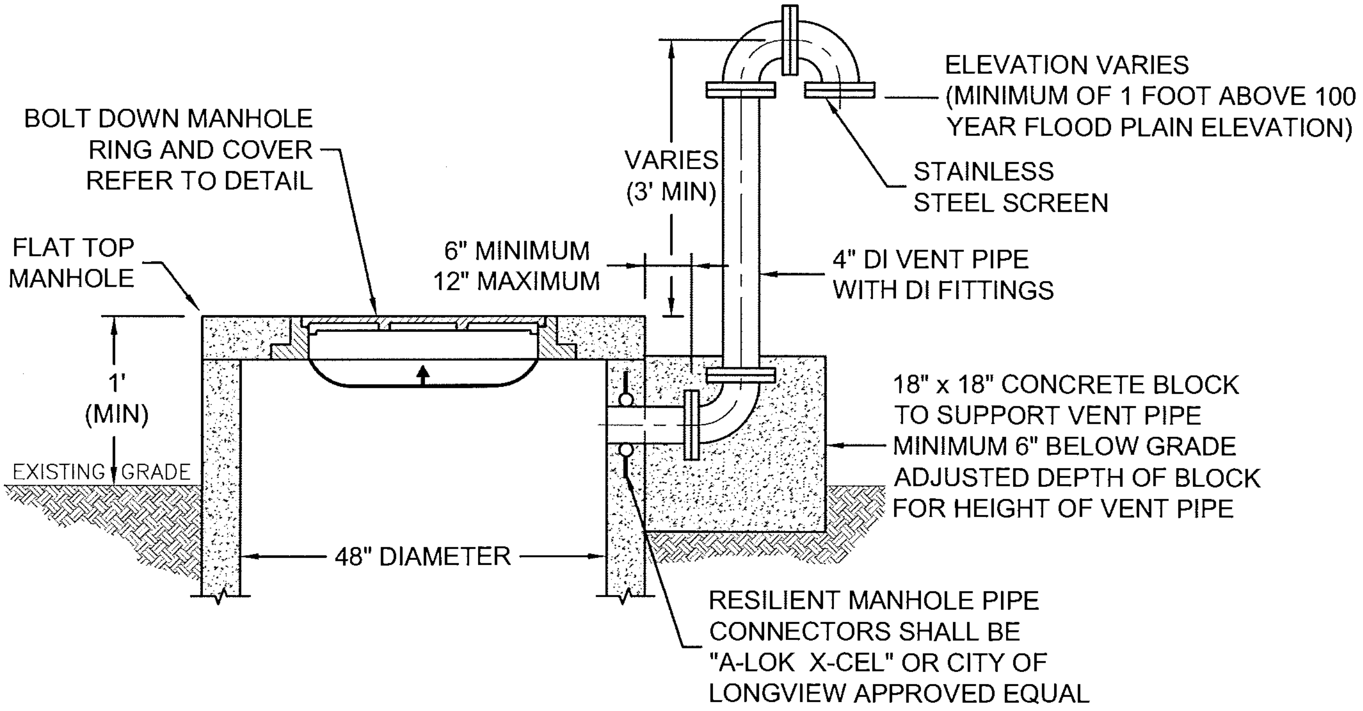
3. THE RING AND LID SHALL WEIGH A MINIMUM OF 210 LBS.

SANITARY SEWER

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

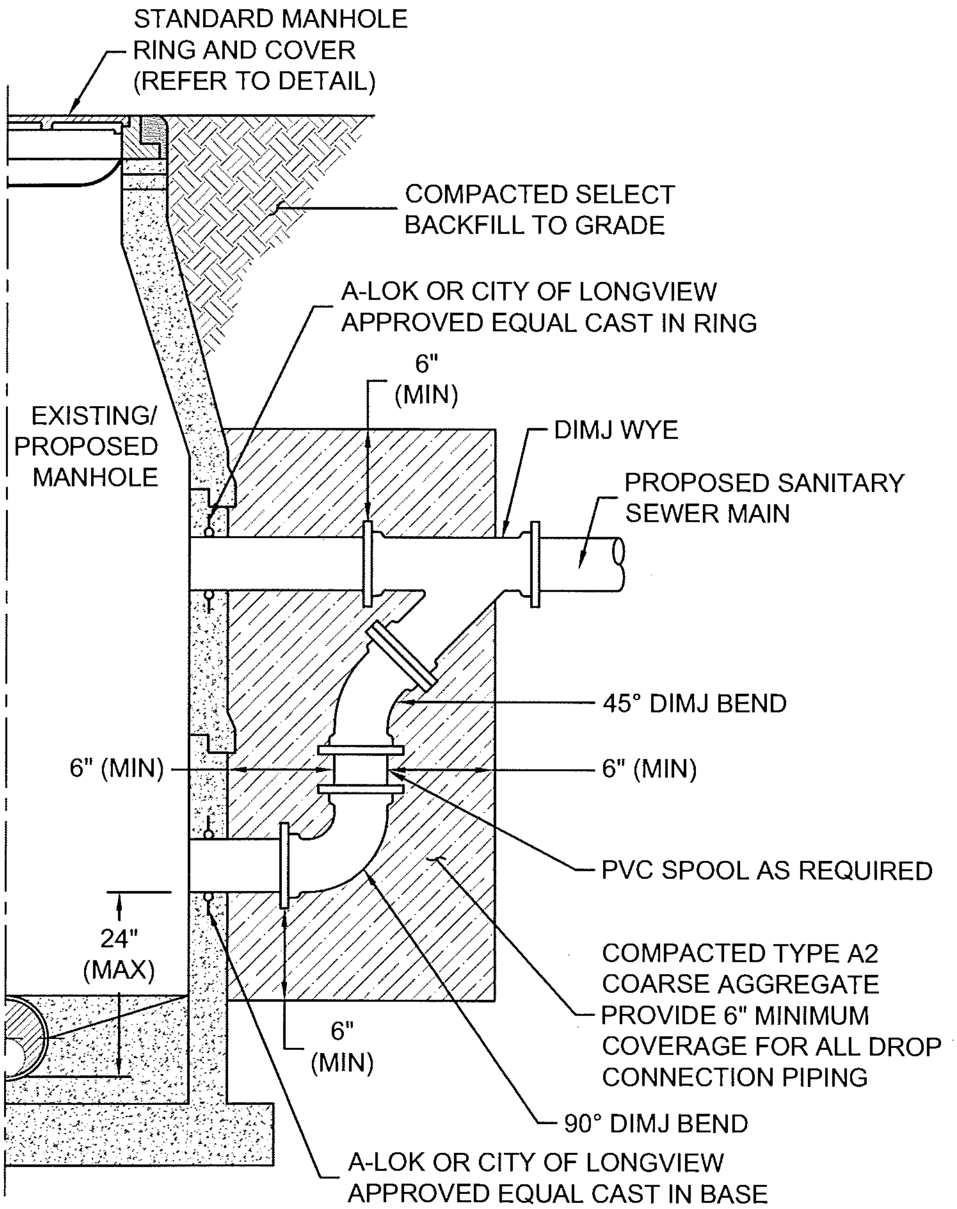
WATERTIGHT MANHOLE
RING AND COVER


BOLT DOWN MANHOLE
RING AND COVER
REFER TO DETAIL
FLAT TOP
MANHOLE
6" MINIMUM
12" MAXIMUM
VARIES
(3' MIN)
ELEVATION VARIES
(MINIMUM OF 1 FOOT ABOVE 100
YEAR FLOOD PLAIN ELEVATION)
STAINLESS
STEEL SCREEN
4" DI VENT PIPE
WITH DI FITTINGS
1'
(MIN)
EXISTING GRADE
18" x 18" CONCRETE BLOCK
TO SUPPORT VENT PIPE
MINIMUM 6" BELOW GRADE
ADJUSTED DEPTH OF BLOCK
FOR HEIGHT OF VENT PIPE
48" DIAMETER
RESILIENT MANHOLE PIPE
CONNECTORS SHALL BE
"A-LOK X-CEL" OR CITY OF
LONGVIEW APPROVED EQUAL

NOTES:

1. VENT PIPE AND FITTINGS SHALL BE 4" DIAMETER DI WITH FLANGED CONNECTIONS.
2. EXTEND VENT TO ABOVE 100 YEAR FLOODPLAIN PER TCEQ REQUIREMENTS.
3. INSTALL BLIND FLANGE WITH 2" DIAMETER HOLE DRILLED FOR VENTING. INSTALL #16 SS MESH BETWEEN BLIND FLANGE AND 90 BEND.
4. LOCATE VENT AS HIGH AS POSSIBLE IN TOP OF MANHOLE SECTION. IF MANHOLE DIAMETER IS LARGE ENOUGH, OFFSET MANHOLE LOCATION AND MOUNT VENT IN TOP OF MANHOLE WITH PLAIN END BY FLANGE END WALL PIPE CAST INTO MANHOLE TOP.
5. INSTALL CONCRETE BLOCK TO SUPPORT VENT PIPE. EXTEND BLOCK A MINIMUM OF 6" BELOW GRADE AND BEAR ON COMPACTED MATERIAL.

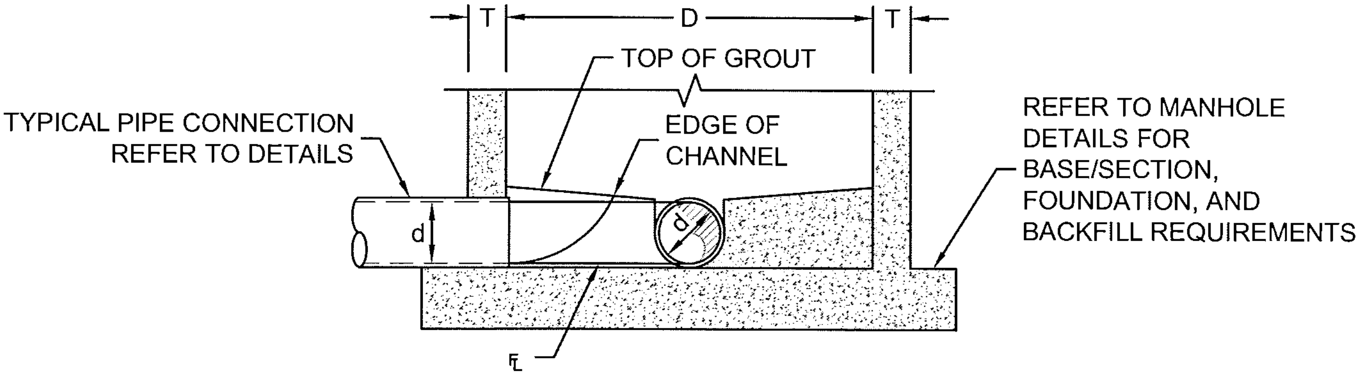
	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER MANHOLE VENT


STANDARD MANHOLE RING AND COVER (REFER TO DETAIL)
COMPACTED SELECT BACKFILL TO GRADE
A-LOK OR CITY OF LONGVIEW APPROVED EQUAL CAST IN RING
6" (MIN)
DIMJ WYE
EXISTING/ PROPOSED MANHOLE
PROPOSED SANITARY SEWER MAIN
45° DIMJ BEND
6" (MIN)
6" (MIN)
PVC SPOOL AS REQUIRED
24" (MAX)
COMPACTED TYPE A2 COARSE AGGREGATE PROVIDE 6" MINIMUM COVERAGE FOR ALL DROP CONNECTION PIPING
6" (MIN)
90° DIMJ BEND
A-LOK OR CITY OF LONGVIEW APPROVED EQUAL CAST IN BASE

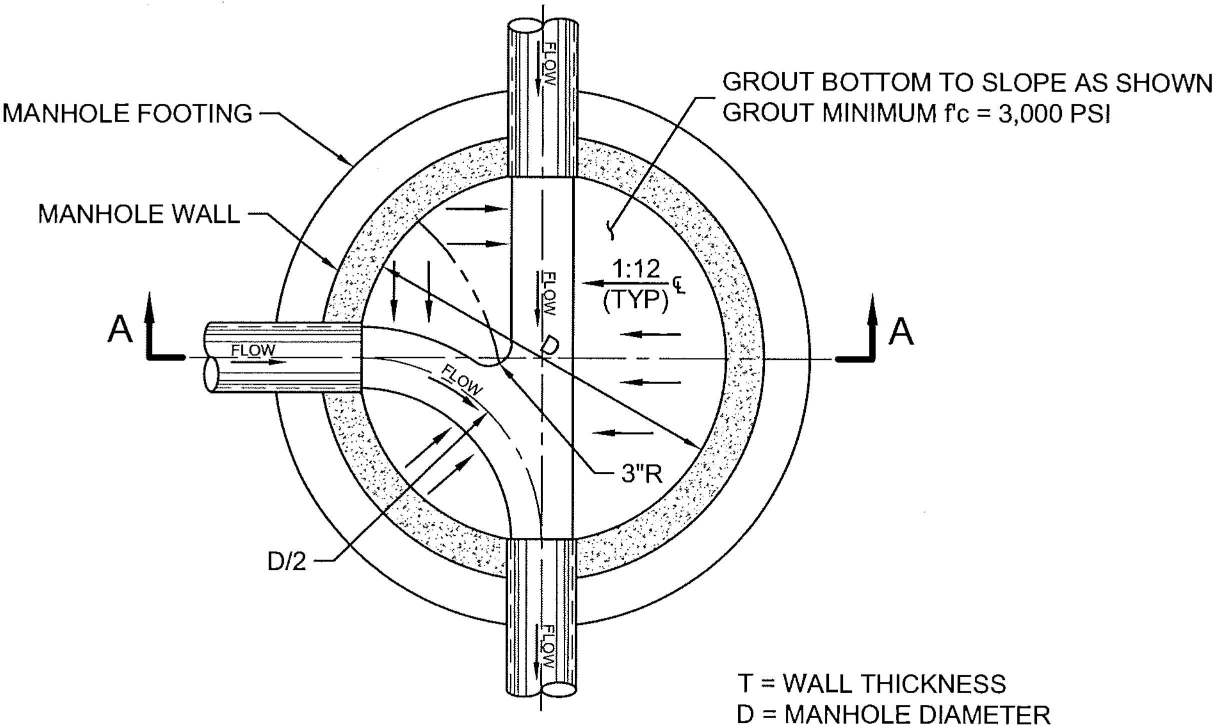
NOTE:

1. DROP MANHOLE CONNECTIONS SHALL BE CONSTRUCTED WHERE A CONNECTION PIPE ENTERS A MANHOLE MORE THAN 24" ABOVE THE MANHOLE INVERT.
2. ALL DI FITTINGS SHALL HAVE MJ RETAINING GLANDS.
3. DROP CONNECTION PIPE AND FITTINGS SHALL BE THE SAME DIAMETER AS THE SEWER MAIN.

	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER DROP MANHOLE CONNECTION


T
D
T
TOP OF GROUT
TYPICAL PIPE CONNECTION
REFER TO DETAILS
EDGE OF
CHANNEL
REFER TO MANHOLE
DETAILS FOR
BASE/SECTION,
FOUNDATION, AND
BACKFILL REQUIREMENTS
d
d
FL

SECTION A-A


FLOW
GROUT BOTTOM TO SLOPE AS SHOWN
GROUT MINIMUM f'c = 3,000 PSI
MANHOLE FOOTING
MANHOLE WALL
1:12
(TYP)
℄
A
A
FLOW
FLOW
FLOW
D
3"R
D/2
FLOW

PLAN

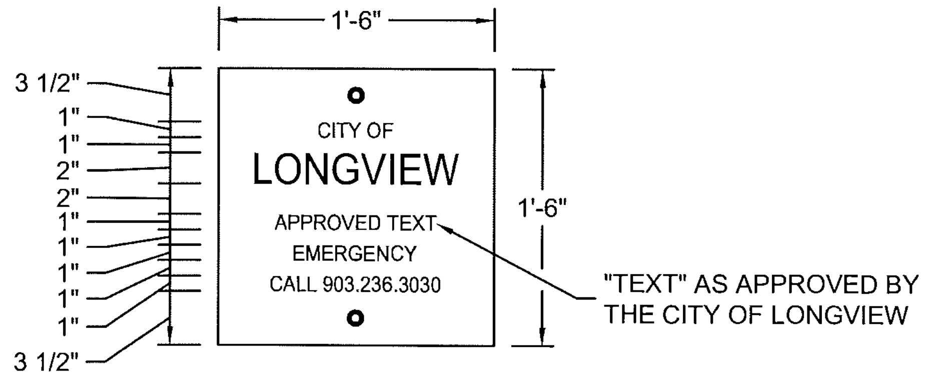
T = WALL THICKNESS
D = MANHOLE DIAMETER
d = PIPE DIAMETER

NOTES:

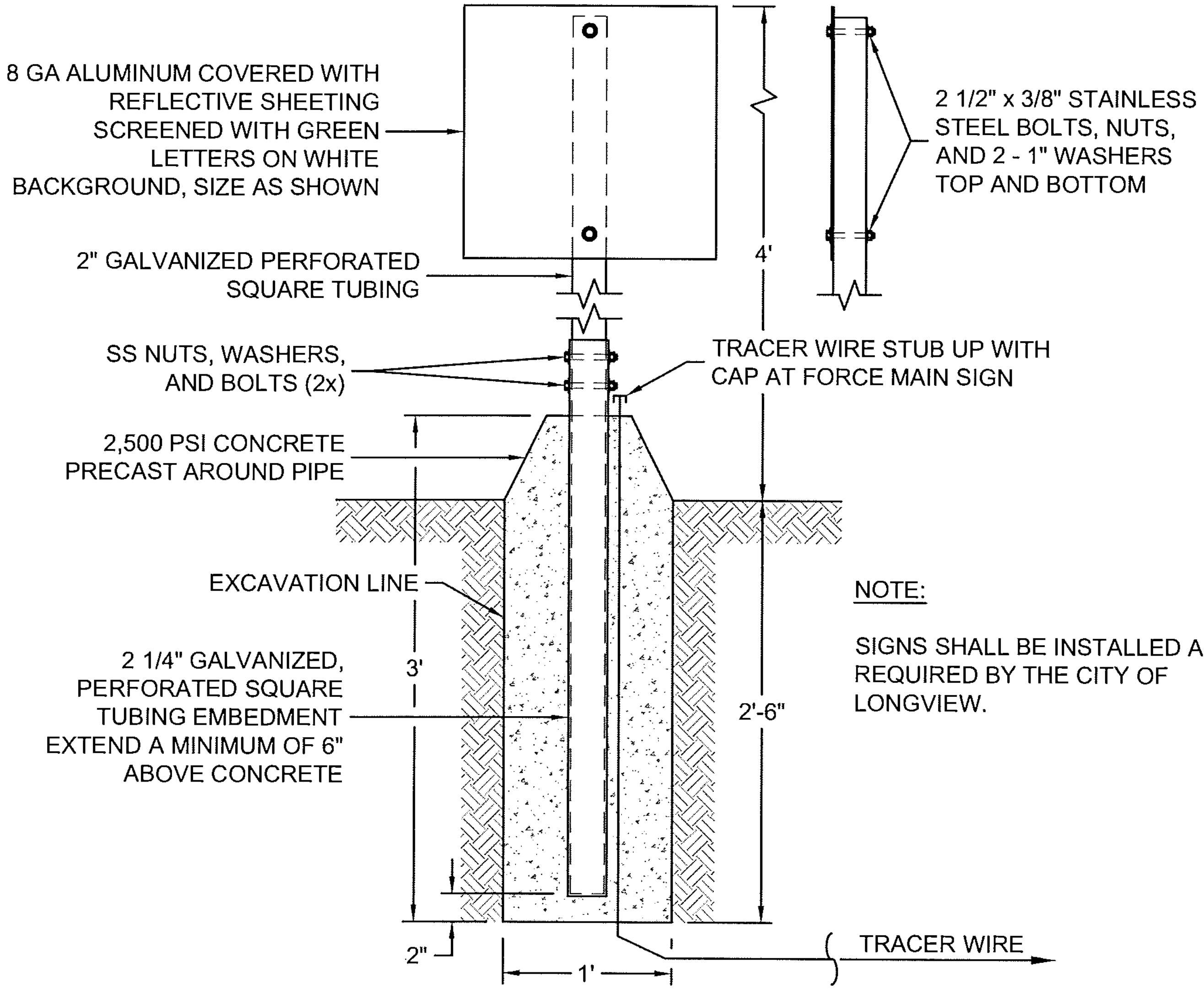
1. REFER TO SANITARY MANHOLE DETAIL FOR CHANNEL DEPTHS.
2. CONNECT INVERT ON EVEN SLOPE FROM INLET PIPE(S) TO OUTLET PIPE.
3. FOR CONNECTIONS TO EXISTING MANHOLES, REMOVE EXISTING INVERT IF NEW LINE PENETRATES MANHOLE BELOW EXISTING INVERT. INSTALL NEW INVERT AFTER CONNECTION IS COMPLETE.

	SANITARY SEWER LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SEWER MANHOLE INVERT

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - MH - INVERT.dwg


1'-6"
3 1/2"
1"
1"
2"
2"
1"
1"
1"
1"
1"
3 1/2"
1'-6"
CITY OF
LONGVIEW
APPROVED TEXT
EMERGENCY
CALL 903.236.3030
"TEXT" AS APPROVED BY THE CITY OF LONGVIEW

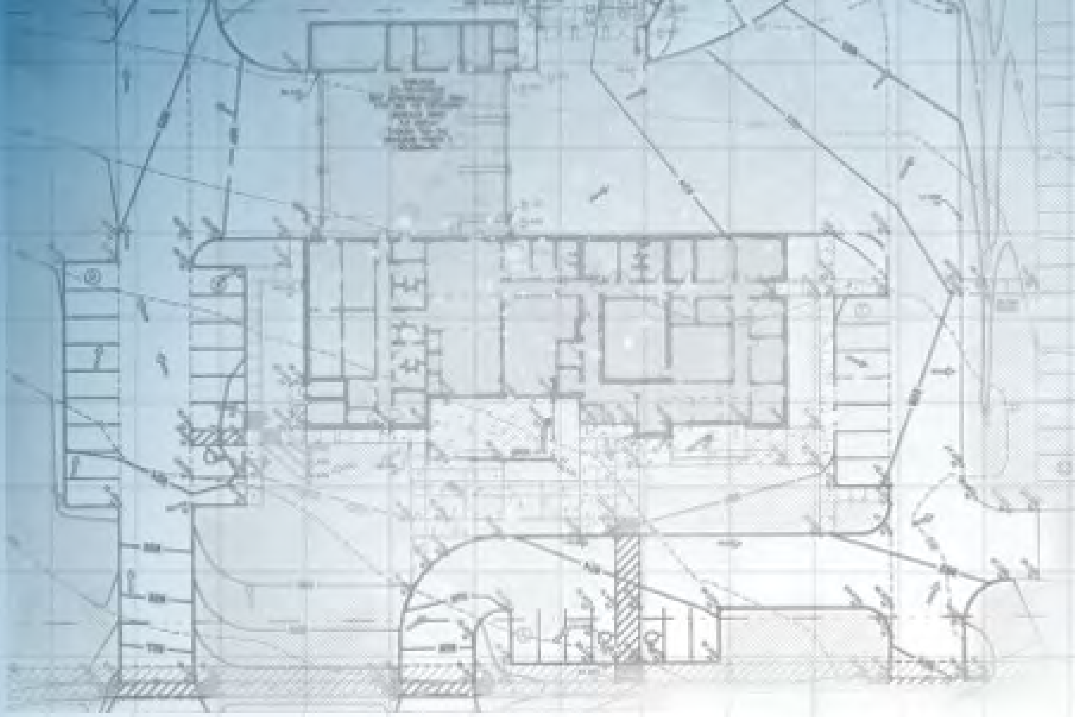
MARKER SIGN LAYOUT


8 GA ALUMINUM COVERED WITH REFLECTIVE SHEETING SCREENED WITH GREEN LETTERS ON WHITE BACKGROUND, SIZE AS SHOWN
2 1/2" x 3/8" STAINLESS STEEL BOLTS, NUTS, AND 2 - 1" WASHERS TOP AND BOTTOM
2" GALVANIZED PERFORATED SQUARE TUBING
4'
SS NUTS, WASHERS, AND BOLTS (2x)
TRACER WIRE STUB UP WITH CAP AT FORCE MAIN SIGN
2,500 PSI CONCRETE PRECAST AROUND PIPE
EXCAVATION LINE
3'
2 1/4" GALVANIZED, PERFORATED SQUARE TUBING EMBEDMENT EXTEND A MINIMUM OF 6" ABOVE CONCRETE
2'-6"
2"
1'
TRACER WIRE

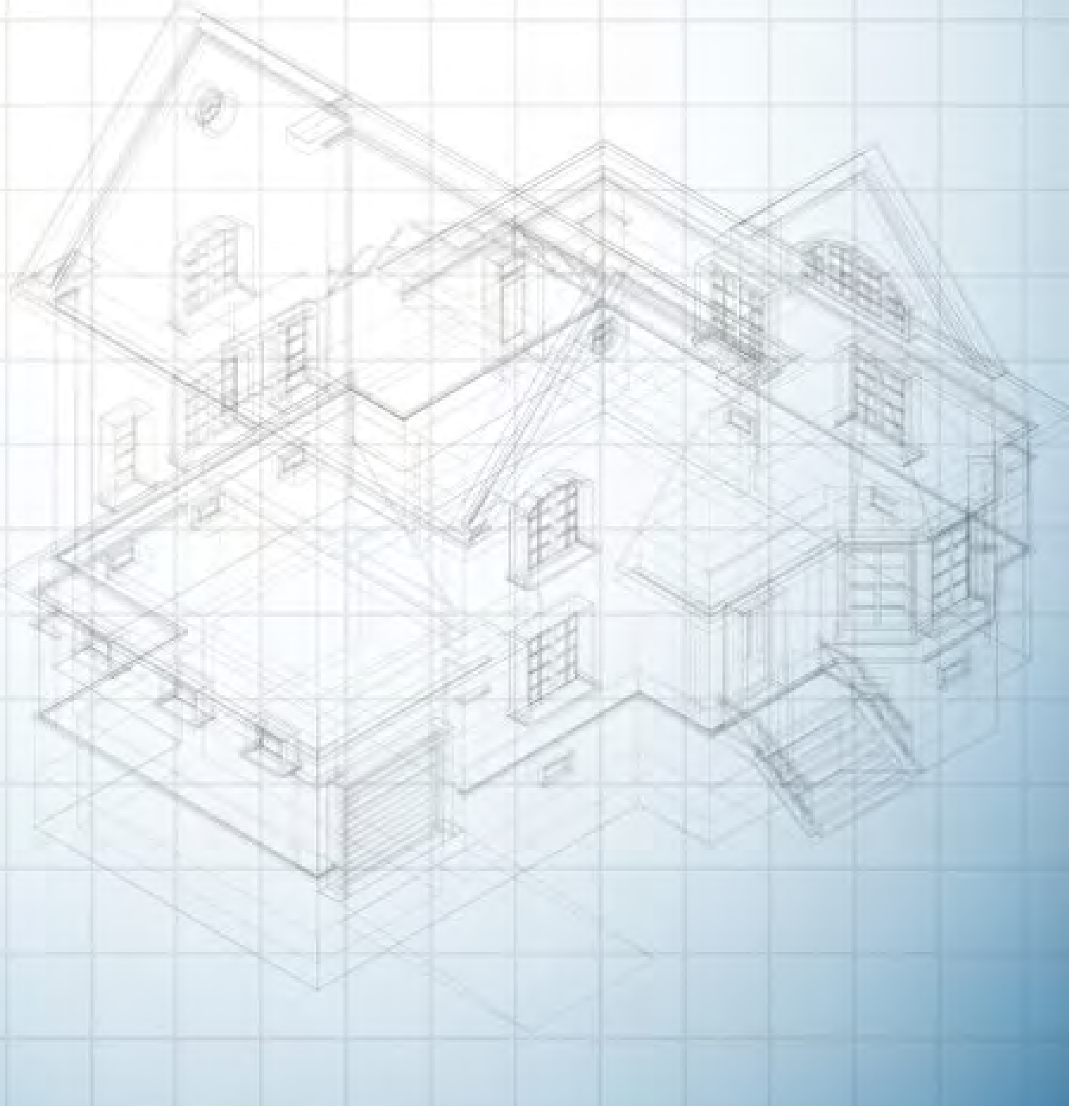
NOTE:

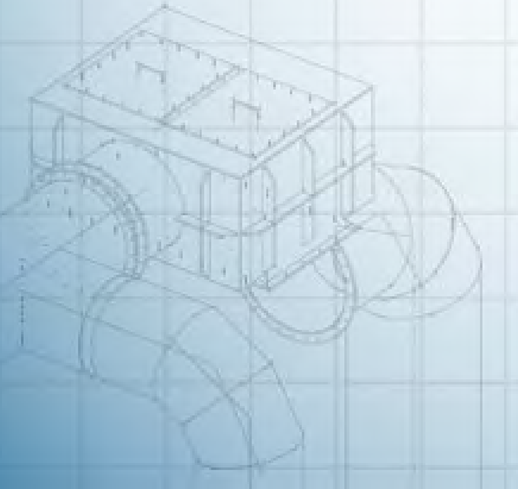
SIGNS SHALL BE INSTALLED AS REQUIRED BY THE CITY OF LONGVIEW.

SANITARY SEWER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SIGN MARKER DETAIL
LATEST REVISION: 3/21/2018		



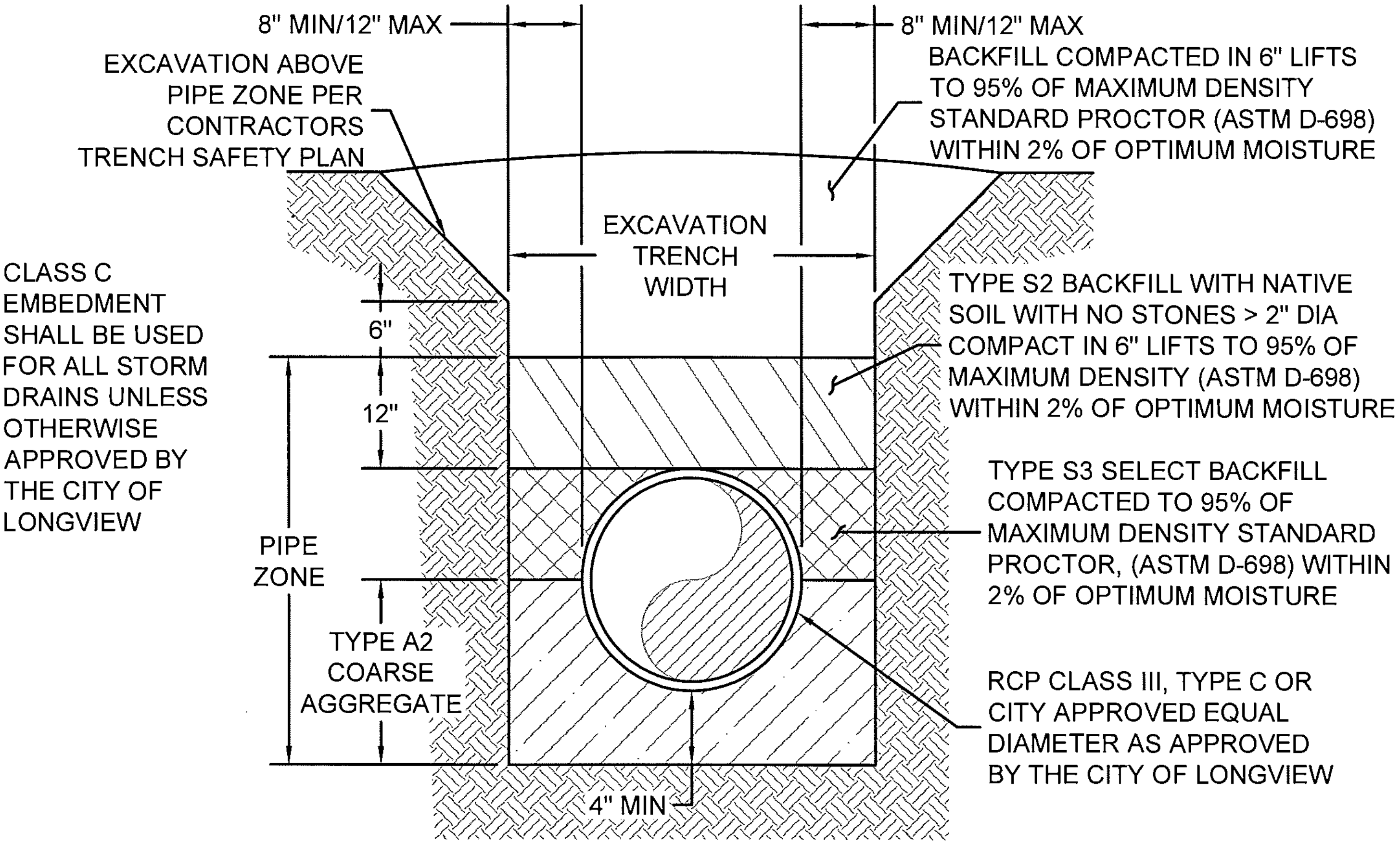
Engineering Details - Storm Drainage





STORM DRAINAGE DETAILS

Storm Drainage Line Class C Embedment..4
Storm Drainage Line Class D Embedment..5
Offset Curb Inlet Page 1 of 3..6
Offset Curb Inlet Page 2 of 3..7
Offset Curb Inlet Page 3 of 3..8
5-Ft Curb Inlet Page 1 of 3..9
5-Ft Curb Inlet Page 2 of 3..10
5-Ft Curb Inlet Page 3 of 3..11
10-Ft Curb Inlet Page 1 of 3..12
10-Ft Curb Inlet Page 2 of 3..13
10-Ft Curb Inlet Page 3 of 3..14
Storm Drainage Manhole Ring and Cover..15
Tie-In to Existing Box or Inlet..16
Junction Box..17
Area Inlet..18
Double Wall HDPE Pipe Install Page 1 of 2..19
Double Wall HDPE Pipe Install Page 2 of 2..20
Joint Sealing..21


8" MIN/12" MAX
8" MIN/12" MAX
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
BACKFILL COMPACTED IN 6" LIFTS TO 95% OF MAXIMUM DENSITY STANDARD PROCTOR (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION TRENCH WIDTH
CLASS C EMBEDMENT SHALL BE USED FOR ALL STORM DRAINS UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW
6"
12"
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT IN 6" LIFTS TO 95% OF MAXIMUM DENSITY (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
TYPE S3 SELECT BACKFILL COMPACTED TO 95% OF MAXIMUM DENSITY STANDARD PROCTOR, (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
PIPE ZONE
TYPE A2 COARSE AGGREGATE
RCP CLASS III, TYPE C OR CITY APPROVED EQUAL DIAMETER AS APPROVED BY THE CITY OF LONGVIEW
4" MIN

TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

STORM SEWER PIPE MATERIAL NOTES:

1. REINFORCED CONCRETE PIPE (RCP): ASTM C76, CLASS III WITH WALL TYPE C; BAR REINFORCEMENT; INSIDE NOMINAL DIAMETER OF AS APPROVED BY THE CITY OF LONGVIEW.

2. ALL PIPE SHALL BE MACHINE-MADE BY A PROCESS WHICH SHALL PROVIDE FOR A UNIFORM PLACEMENT OF ZERO SLUMP CONCRETE IN THE FORM AND COMPACTION BY MECHANICAL DEVICES ASSURING A DENSE CONCRETE IN THE FINISHED PRODUCT.

3. REINFORCED CONCRETE PIPE JOINT DEVICE: ASTM C443, RUBBER COMPRESSION GASKET JOINT. JOINTS SHALL BE MADE WITH FORSHEDA PRE-LUBRICATED GASKETS.

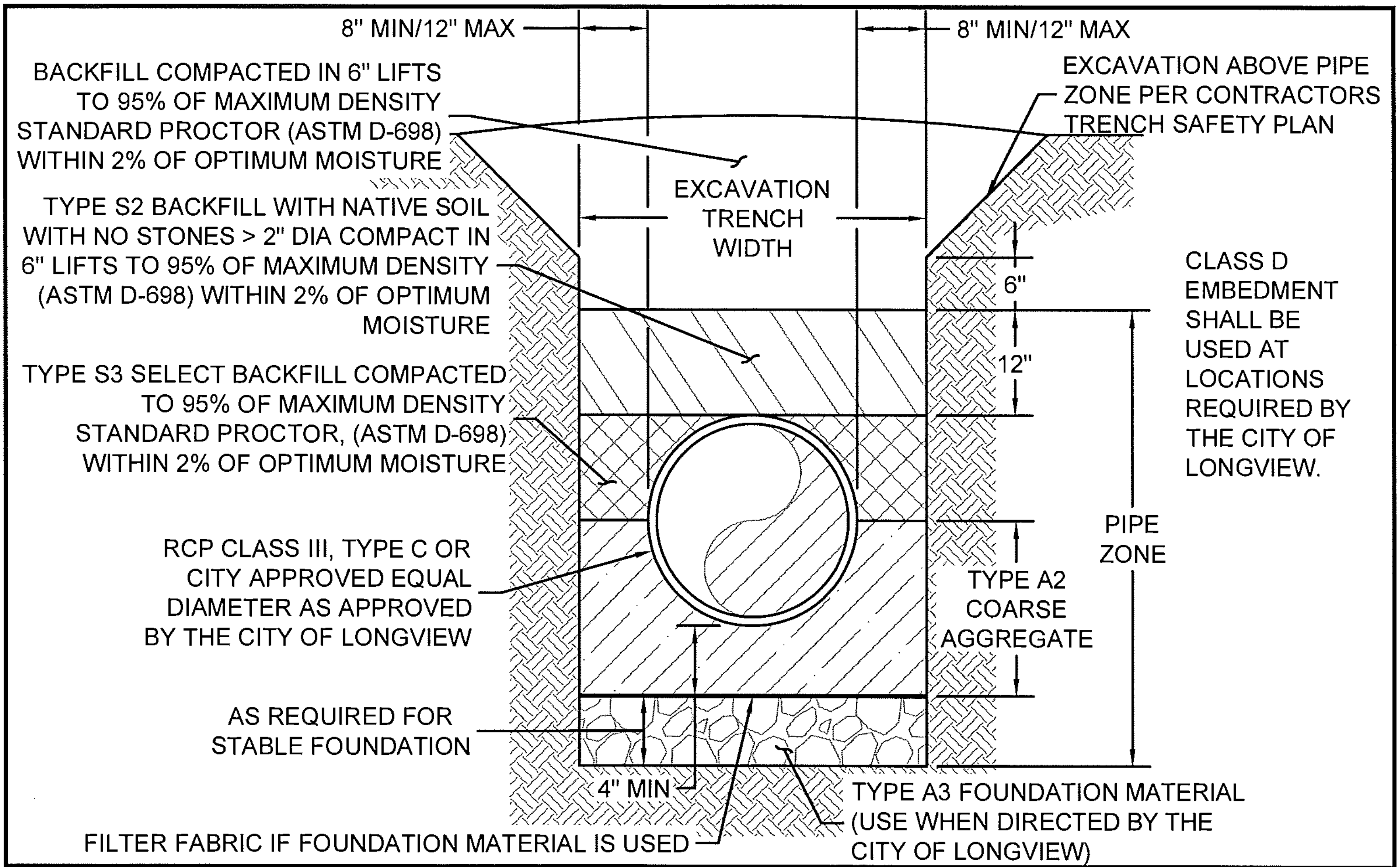
4. SEAL JOINTS WATERTIGHT, AND WRAP ALL JOINTS WITH DUPONT TYPAR FABRIC A MINIMUM OF 24 INCHES AROUND THE PIPE AND SHALL BE 18 INCHES WIDE.

STORM DRAINAGE

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

STORM DRAINAGE LINE
CLASS C EMBEDMENT


8" MIN/12" MAX
8" MIN/12" MAX
BACKFILL COMPACTED IN 6" LIFTS TO 95% OF MAXIMUM DENSITY STANDARD PROCTOR (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
EXCAVATION TRENCH WIDTH
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT IN 6" LIFTS TO 95% OF MAXIMUM DENSITY (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
6"
12"
CLASS D EMBEDMENT SHALL BE USED AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW.
TYPE S3 SELECT BACKFILL COMPACTED TO 95% OF MAXIMUM DENSITY STANDARD PROCTOR, (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
PIPE ZONE
RCP CLASS III, TYPE C OR CITY APPROVED EQUAL DIAMETER AS APPROVED BY THE CITY OF LONGVIEW
TYPE A2 COARSE AGGREGATE
AS REQUIRED FOR STABLE FOUNDATION
4" MIN
TYPE A3 FOUNDATION MATERIAL (USE WHEN DIRECTED BY THE CITY OF LONGVIEW)
FILTER FABRIC IF FOUNDATION MATERIAL IS USED

TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 NO. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE A3	COARSE STONE OR CRUSHED GRAVEL. FOUNDATION MATERIAL SHALL BE PIT RUN ANGULAR CRUSHED, NATURAL WASHED STONE FREE OF SHALE, CLAY, FRIABLE MATERIAL AND DEBRIS; WELL GRADED BETWEEN 1" AND 3" IN SIZE, WITH A MINIMUM OF 90% RETAINED ON A 1" SIEVE.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

STORM SEWER PIPE MATERIAL NOTES:

1. REINFORCED CONCRETE PIPE (RCP): ASTM C76, CLASS III WITH WALL TYPE C; BAR REINFORCEMENT; INSIDE NOMINAL DIAMETER OF AS APPROVED BY THE CITY OF LONGVIEW.

2. ALL PIPE SHALL BE MACHINE-MADE BY A PROCESS WHICH SHALL PROVIDE FOR A UNIFORM PLACEMENT OF ZERO SLUMP CONCRETE IN THE FORM AND COMPACTION BY MECHANICAL DEVICES ASSURING A DENSE CONCRETE IN THE FINISHED PRODUCT.

3. REINFORCED CONCRETE PIPE JOINT DEVICE: ASTM C443, RUBBER COMPRESSION GASKET JOINT. JOINTS SHALL BE MADE WITH FORSHEDA PRE-LUBRICATED GASKETS.

4. SEAL JOINTS WATERTIGHT, AND WRAP ALL JOINTS WITH DUPONT TYPAR FABRIC A MINIMUM OF 24 INCHES AROUND THE PIPE AND SHALL BE 18 INCHES WIDE.

	STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	STORM DRAINAGE LINE CLASS D EMBEDMENT
	LATEST REVISION: 10/26/2018		

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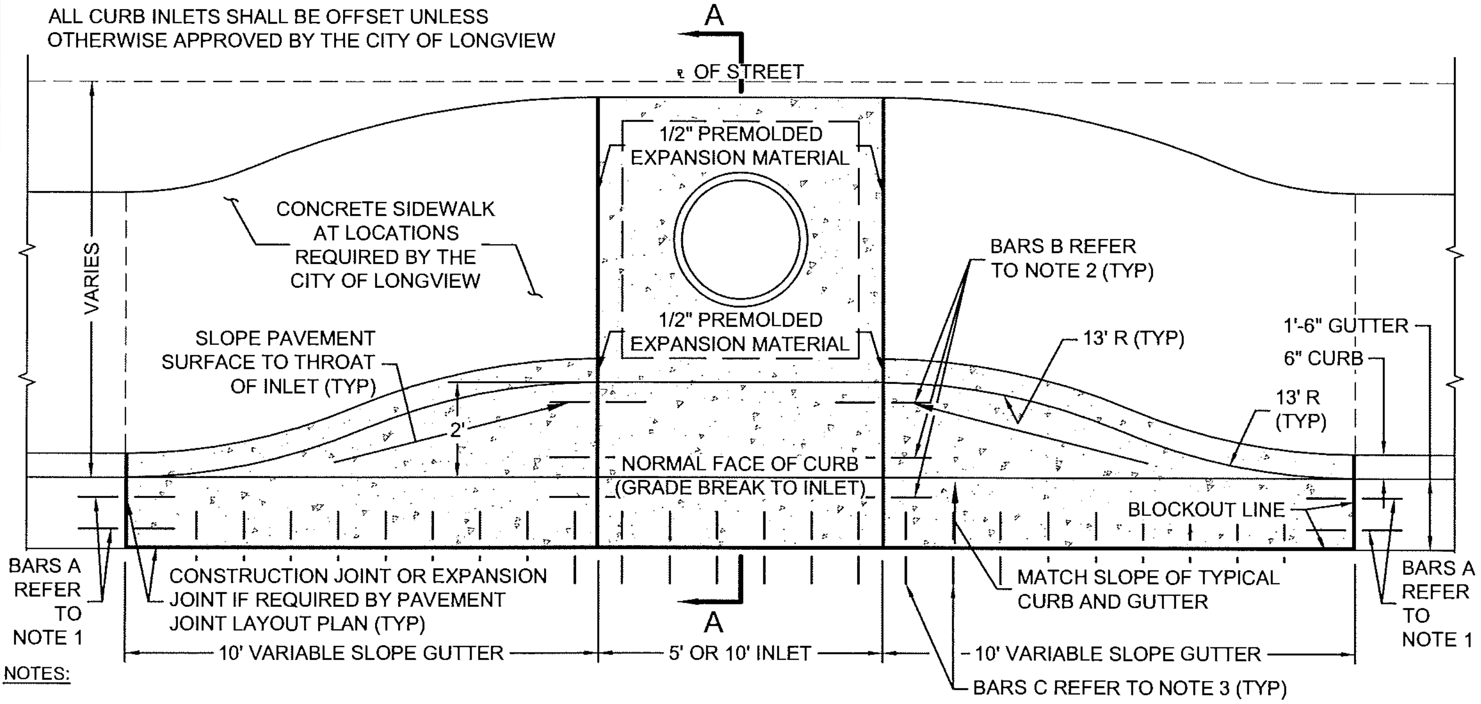
ALL CURB INLETS SHALL BE OFFSET UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW


A
℄ OF STREET
1/2" PREMOLDED EXPANSION MATERIAL
CONCRETE SIDEWALK AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
VARIES
BARS B REFER TO NOTE 2 (TYP)
1/2" PREMOLDED EXPANSION MATERIAL
SLOPE PAVEMENT SURFACE TO THROAT OF INLET (TYP)
13' R (TYP)
1'-6" GUTTER
6" CURB
13' R (TYP)
2'
NORMAL FACE OF CURB (GRADE BREAK TO INLET)
BLOCKOUT LINE
BARS A REFER TO NOTE 1
CONSTRUCTION JOINT OR EXPANSION JOINT IF REQUIRED BY PAVEMENT JOINT LAYOUT PLAN (TYP)
MATCH SLOPE OF TYPICAL CURB AND GUTTER
BARS A REFER TO NOTE 1
A
10' VARIABLE SLOPE GUTTER
5' OR 10' INLET
10' VARIABLE SLOPE GUTTER
BARS C REFER TO NOTE 3 (TYP)

NOTES:

1. 1/2" DIAMETER x 2' LONG SMOOTH DOWEL BARS. EPOXY COAT END IN CURB AND GUTTER, GREASE AND CAP END IN INLET. TWO BARS PER TIE IN (TYP).
2. 1/2" DIAMETER x 2' LONG SMOOTH DOWEL BARS. EPOXY ONE END AND GREASE AND CAP OTHER END (4 BARS TYP).
3. SMOOTH DOWEL BARS BETWEEN INLET AND CONCRETE PAVEMENT. 7/8" DIAMETER x 18" LONG SPACED AT 12" OC. FOR LENGTH OF JOINT EPOXY INTO PAVEMENT AND GREASE AND CAP END IN APRON.
4. PROVIDE SAWCUT JOINT OR CONSTRUCTION JOINT IN LINE WITH BLOCKOUT LINES FOR CONCRETE PAVEMENT.
5. PROVIDE CONSTRUCTION EXPANSION JOINTS AT BLOCKOUT EDGES IF REQUIRED FOR STREET PAVEMENT JOINTING PLAN.
6. SAWCUT JOINT SHALL BE TOOLED THROUGH INLET THROAT.

STORM DRAINAGE

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

OFFSET CURB INLET
PAGE 1 OF 3

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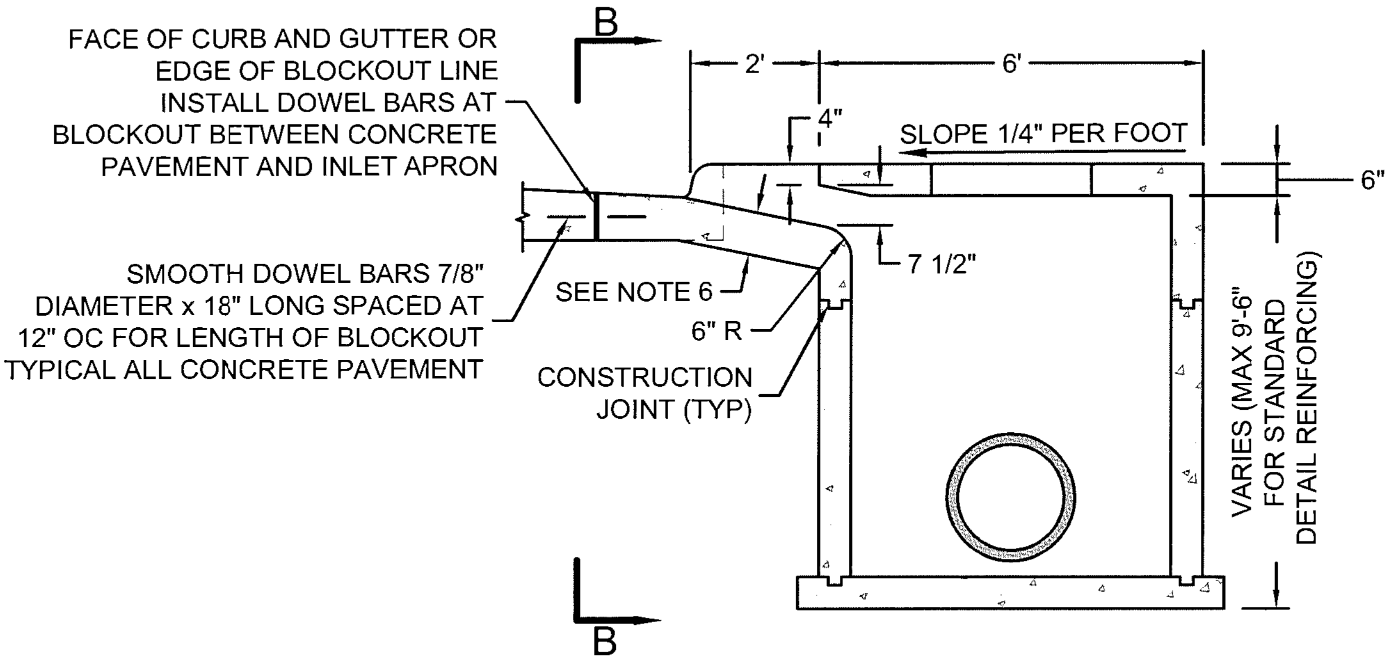
FACE OF CURB AND GUTTER OR EDGE OF BLOCKOUT LINE
INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CONCRETE PAVEMENT AND INLET APRON
SMOOTH DOWEL BARS 7/8" DIAMETER x 18" LONG SPACED AT 12" OC FOR LENGTH OF BLOCKOUT TYPICAL ALL CONCRETE PAVEMENT
B
B
SEE NOTE 6
6" R
CONSTRUCTION JOINT (TYP)
2'
6'
4"
SLOPE 1/4" PER FOOT
7 1/2"
6"
VARIES (MAX 9'-6" FOR STANDARD DETAIL REINFORCING)

SECTION A-A

NTS

NOTES:

1. REINFORCEMENT OMITTED FOR CLARITY. REFER TO CURB INLET DETAILS FOR REQUIRED REINFORCEMENT.
2. ALL CURB INLETS SHALL BE OFFSET UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
3. INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CURB AND GUTTER AND CONCRETE PAVEMENT.
4. ALL CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
5. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4 CHAMFER. ALL EXPOSED CONCRETE SHALL HAVE BROOM FINISH.
6. INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN).

STORM
DRAINAGE

LATEST
REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

OFFSET CURB INLET
PAGE 2 OF 3

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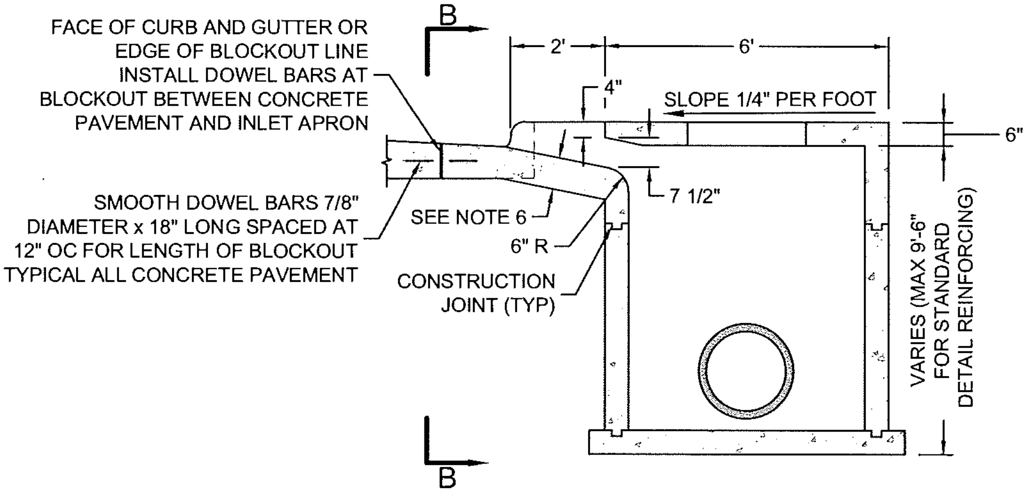

FACE OF CURB AND GUTTER OR EDGE OF BLOCKOUT LINE
INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CONCRETE PAVEMENT AND INLET APRON
SMOOTH DOWEL BARS 7/8" DIAMETER x 18" LONG SPACED AT 12" OC FOR LENGTH OF BLOCKOUT TYPICAL ALL CONCRETE PAVEMENT
B
B
2'
6'
4"
SLOPE 1/4" PER FOOT
6"
7 1/2"
SEE NOTE 6
6" R
CONSTRUCTION JOINT (TYP)
VARIES (MAX 9'-6" FOR STANDARD DETAIL REINFORCING)

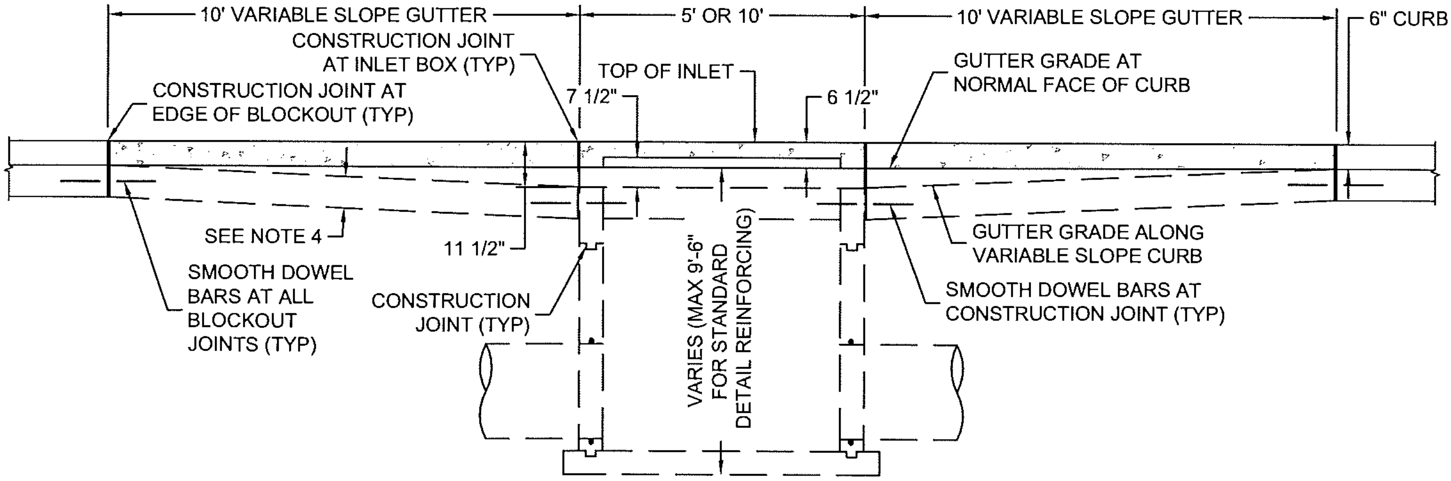
SECTION A-A

NTS

NOTES:

1. REINFORCEMENT OMITTED FOR CLARITY. REFER TO CURB INLET DETAILS FOR REQUIRED REINFORCEMENT.
2. ALL CURB INLETS SHALL BE OFFSET UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
3. INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CURB AND GUTTER AND CONCRETE PAVEMENT.
4. ALL CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
5. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4 CHAMFER. ALL EXPOSED CONCRETE SHALL HAVE BROOM FINISH.
6. INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN).

STORM DRAINAGE LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	OFFSET CURB INLET PAGE 2 OF 3


10' VARIABLE SLOPE GUTTER
5' OR 10'
10' VARIABLE SLOPE GUTTER
6" CURB
CONSTRUCTION JOINT AT INLET BOX (TYP)
TOP OF INLET
GUTTER GRADE AT NORMAL FACE OF CURB
CONSTRUCTION JOINT AT EDGE OF BLOCKOUT (TYP)
7 1/2"
6 1/2"
SEE NOTE 4
11 1/2"
GUTTER GRADE ALONG VARIABLE SLOPE CURB
SMOOTH DOWEL BARS AT ALL BLOCKOUT JOINTS (TYP)
CONSTRUCTION JOINT (TYP)
VARIES (MAX 9'-6" FOR STANDARD DETAIL REINFORCING)
SMOOTH DOWEL BARS AT CONSTRUCTION JOINT (TYP)

SECTION B-B

NTS

NOTES:

1. REINFORCEMENT OMITTED FOR CLARITY. REFER TO CURB INLET DETAILS FOR REQUIRED REINFORCEMENT.
2. ALL CONSTRUCTION JOINT SHALL MATCH THE PAVEMENT PLAN.
3. ALL JOINT SHALL INCLUDE BACKER ROD AND SEALANT.
4. INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN).

	STORM DRAINAGE LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	OFFSET CURB INLET PAGE 3 OF 3

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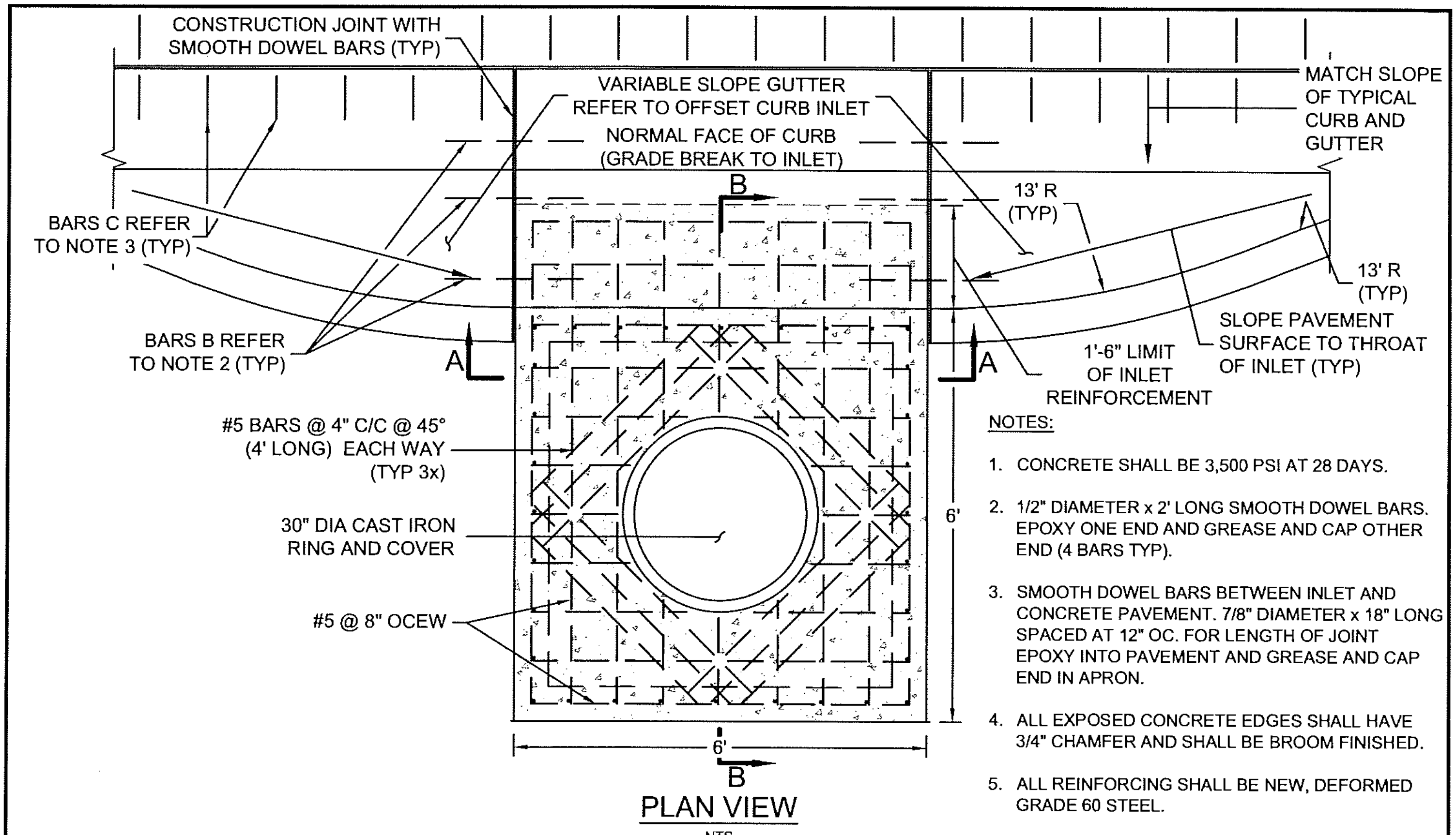

CONSTRUCTION JOINT WITH SMOOTH DOWEL BARS (TYP)
VARIABLE SLOPE GUTTER REFER TO OFFSET CURB INLET
NORMAL FACE OF CURB (GRADE BREAK TO INLET)
MATCH SLOPE OF TYPICAL CURB AND GUTTER
B
13' R (TYP)
13' R (TYP)
BARS C REFER TO NOTE 3 (TYP)
BARS B REFER TO NOTE 2 (TYP)
A
A
SLOPE PAVEMENT SURFACE TO THROAT OF INLET (TYP)
1'-6" LIMIT OF INLET REINFORCEMENT
#5 BARS @ 4" C/C @ 45° (4' LONG) EACH WAY (TYP 3x)
30" DIA CAST IRON RING AND COVER
6'
#5 @ 8" OCEW
6'
B

PLAN VIEW

NTS

NOTES:

1. CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
2. 1/2" DIAMETER x 2' LONG SMOOTH DOWEL BARS. EPOXY ONE END AND GREASE AND CAP OTHER END (4 BARS TYP).
3. SMOOTH DOWEL BARS BETWEEN INLET AND CONCRETE PAVEMENT. 7/8" DIAMETER x 18" LONG SPACED AT 12" OC. FOR LENGTH OF JOINT EPOXY INTO PAVEMENT AND GREASE AND CAP END IN APRON.
4. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4" CHAMFER AND SHALL BE BROOM FINISHED.
5. ALL REINFORCING SHALL BE NEW, DEFORMED GRADE 60 STEEL.
6. REINFORCEMENT SHALL BE CONTINUOUS AT ALL JOINTS AND CORNERS.
7. REINFORCING BARS SHALL HAVE A MINIMUM OF 18" LAP AND SHALL BE TIED SECURELY WITH STEEL TIES AT ALL LAPS.

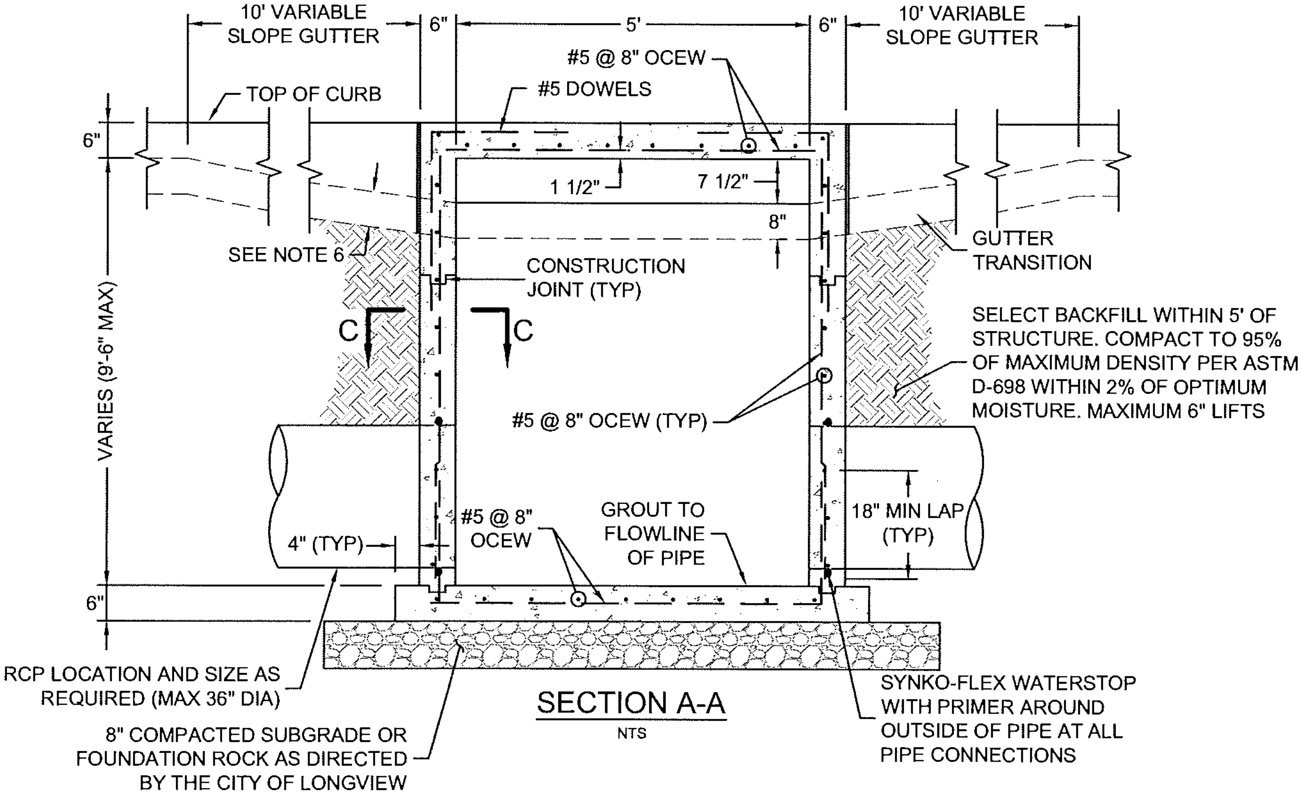
STORM DRAINAGE

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

5-FT CURB INLET
PAGE 1 OF 3

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - STRM - 5' CURB INLET.dwg


10' VARIABLE SLOPE GUTTER
6"
5'
6"
10' VARIABLE SLOPE GUTTER
#5 @ 8" OCEW
#5 DOWELS
TOP OF CURB
6"
1 1/2"
7 1/2"
8"
SEE NOTE 6
GUTTER TRANSITION
CONSTRUCTION JOINT (TYP)
C
C
VARIES (9'-6" MAX)
SELECT BACKFILL WITHIN 5' OF STRUCTURE. COMPACT TO 95% OF MAXIMUM DENSITY PER ASTM D-698 WITHIN 2% OF OPTIMUM MOISTURE. MAXIMUM 6" LIFTS
#5 @ 8" OCEW (TYP)
18" MIN LAP (TYP)
GROUT TO FLOWLINE OF PIPE
#5 @ 8" OCEW
4" (TYP)
6"
RCP LOCATION AND SIZE AS REQUIRED (MAX 36" DIA)
8" COMPACTED SUBGRADE OR FOUNDATION ROCK AS DIRECTED BY THE CITY OF LONGVIEW
SYNKO-FLEX WATERSTOP WITH PRIMER AROUND OUTSIDE OF PIPE AT ALL PIPE CONNECTIONS

SECTION A-A

NTS

NOTES:

1. CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
2. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4" CHAMFER AND SHALL BE BROOM FINISHED.
3. ALL REINFORCING SHALL BE NEW, DEFORMED GRADE 60 STEEL.
4. REINFORCEMENT SHALL BE CONTINUOUS AT ALL JOINTS AND CORNERS.
5. REINFORCING BARS SHALL HAVE A MINIMUM OF 18" LAP AND SHALL BE TIED SECURELY WITH STEEL TIES AT ALL LAPS.
6. INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN).

STORM DRAINAGE

LATEST REVISION: 3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

5-FT CURB INLET
PAGE 2 OF 3

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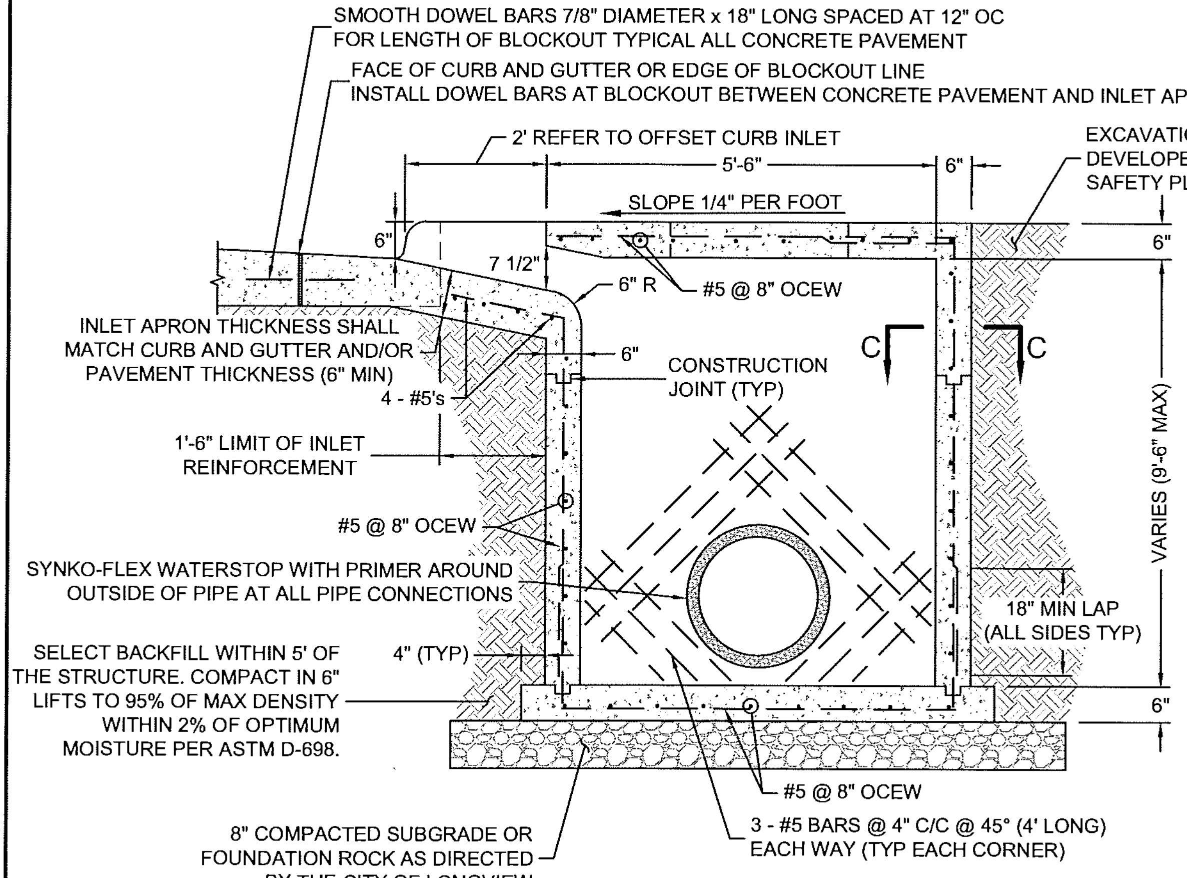
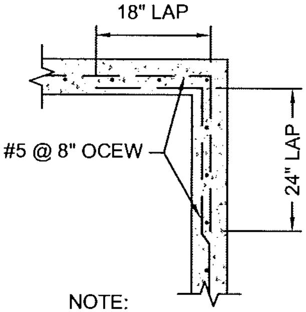

SMOOTH DOWEL BARS 7/8" DIAMETER x 18" LONG SPACED AT 12" OC
FOR LENGTH OF BLOCKOUT TYPICAL ALL CONCRETE PAVEMENT
FACE OF CURB AND GUTTER OR EDGE OF BLOCKOUT LINE
INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CONCRETE PAVEMENT AND INLET APRON
2' REFER TO OFFSET CURB INLET
5'-6"
6"
EXCAVATION PER
DEVELOPER/CONTRACTOR
SAFETY PLAN
SLOPE 1/4" PER FOOT
6"
6"
7 1/2"
6" R
#5 @ 8" OCEW
INLET APRON THICKNESS SHALL
MATCH CURB AND GUTTER AND/OR
PAVEMENT THICKNESS (6" MIN)
6"
4 - #5's
CONSTRUCTION
JOINT (TYP)
C
C
1'-6" LIMIT OF INLET
REINFORCEMENT
VARIES (9'-6" MAX)
#5 @ 8" OCEW
SYNKO-FLEX WATERSTOP WITH PRIMER AROUND
OUTSIDE OF PIPE AT ALL PIPE CONNECTIONS
18" MIN LAP
(ALL SIDES TYP)
SELECT BACKFILL WITHIN 5' OF
THE STRUCTURE. COMPACT IN 6"
LIFTS TO 95% OF MAX DENSITY
WITHIN 2% OF OPTIMUM
MOISTURE PER ASTM D-698.
4" (TYP)
6"
#5 @ 8" OCEW
8" COMPACTED SUBGRADE OR
FOUNDATION ROCK AS DIRECTED
BY THE CITY OF LONGVIEW
3 - #5 BARS @ 4" C/C @ 45° (4' LONG)
EACH WAY (TYP EACH CORNER)

SECTION B-B

NTS

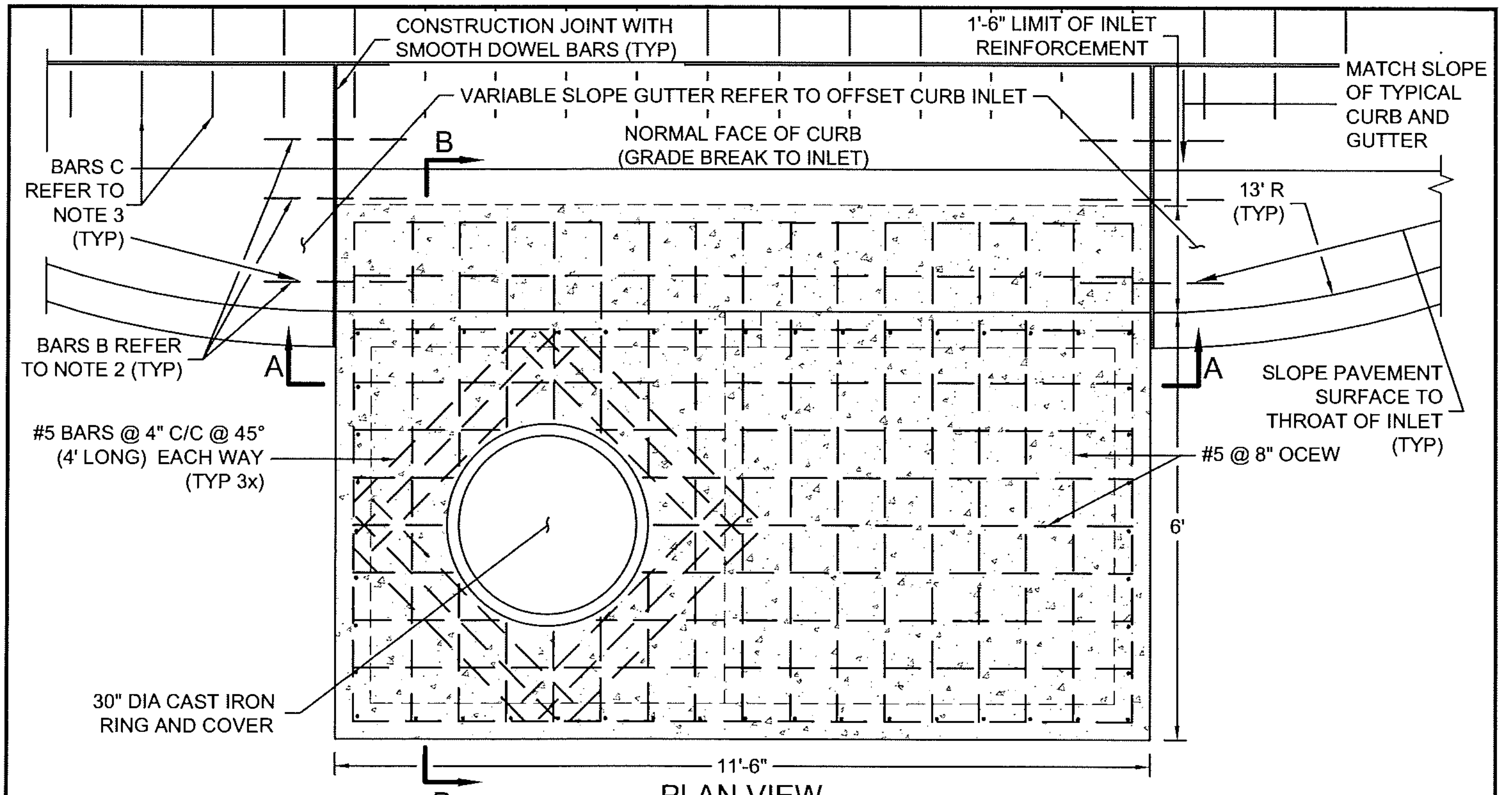

18" LAP
#5 @ 8" OCEW
24" LAP

NOTE:
MINIMUM 18" LAP ALL
REINFORCEMENT.

SECTION C-C

NTS

STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	5-FT CURB INLET PAGE 3 OF 3
LATEST REVISION: 3/21/2018		


CONSTRUCTION JOINT WITH SMOOTH DOWEL BARS (TYP)
1'-6" LIMIT OF INLET REINFORCEMENT
MATCH SLOPE OF TYPICAL CURB AND GUTTER
VARIABLE SLOPE GUTTER REFER TO OFFSET CURB INLET
NORMAL FACE OF CURB (GRADE BREAK TO INLET)
B
BARS C REFER TO NOTE 3 (TYP)
13' R (TYP)
BARS B REFER TO NOTE 2 (TYP)
A
A
SLOPE PAVEMENT SURFACE TO THROAT OF INLET (TYP)
#5 BARS @ 4" C/C @ 45° (4' LONG) EACH WAY (TYP 3x)
#5 @ 8" OCEW
6'
30" DIA CAST IRON RING AND COVER
11'-6"
B

PLAN VIEW

NTS

NOTES:

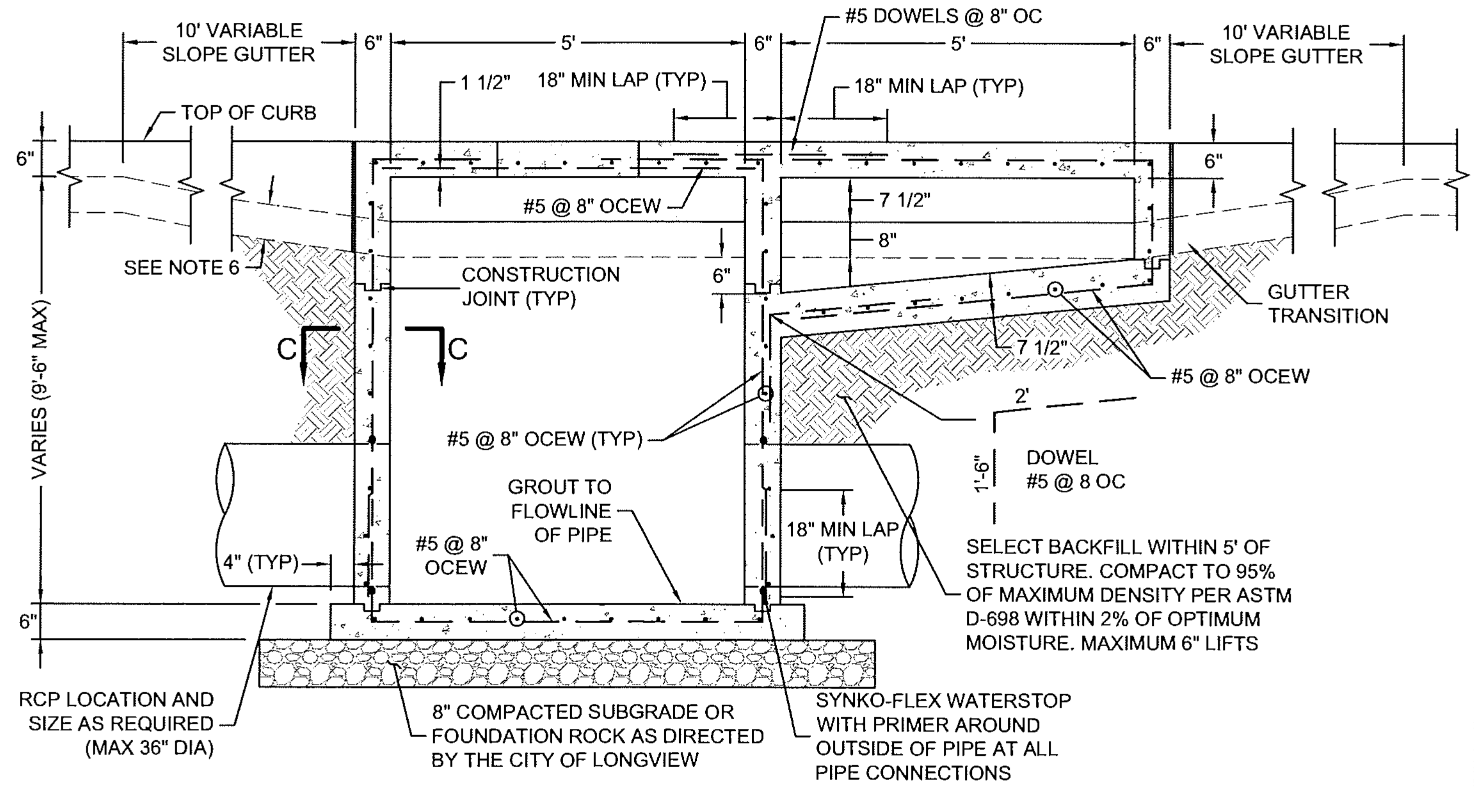
1. CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
2. 1/2" DIAMETER x 2' LONG SMOOTH DOWEL BARS. EPOXY ONE END AND GREASE AND CAP OTHER END (4 BARS TYP).
3. SMOOTH DOWEL BARS BETWEEN INLET AND CONCRETE PAVEMENT. 7/8" DIAMETER x 18" LONG SPACED AT 12" OC. FOR LENGTH OF JOINT EPOXY INTO PAVEMENT AND GREASE AND CAP END IN APRON.
4. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4" CHAMFER AND SHALL BE BROOM FINISHED.
5. ALL REINFORCING SHALL BE NEW, DEFORMED GRADE 60 STEEL.
6. REINFORCEMENT SHALL BE CONTINUOUS AT ALL JOINTS AND CORNERS.
7. REINFORCING BARS SHALL HAVE A MINIMUM OF 18" LAP AND SHALL BE TIED SECURELY WITH STEEL TIES AT ALL LAPS.

STORM DRAINAGE

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

10-FT CURB INLET
PAGE 1 OF 3


10' VARIABLE SLOPE GUTTER
6"
5'
6"
#5 DOWELS @ 8" OC
5'
6"
10' VARIABLE SLOPE GUTTER
1 1/2"
18" MIN LAP (TYP)
18" MIN LAP (TYP)
TOP OF CURB
6"
6"
#5 @ 8" OCEW
7 1/2"
8"
SEE NOTE 6
CONSTRUCTION JOINT (TYP)
6"
GUTTER TRANSITION
VARIES (9'-6" MAX)
C
C
7 1/2"
#5 @ 8" OCEW
2'
#5 @ 8" OCEW (TYP)
1'-6"
DOWEL #5 @ 8 OC
GROUT TO FLOWLINE OF PIPE
18" MIN LAP (TYP)
#5 @ 8" OCEW
4" (TYP)
SELECT BACKFILL WITHIN 5' OF STRUCTURE. COMPACT TO 95% OF MAXIMUM DENSITY PER ASTM D-698 WITHIN 2% OF OPTIMUM MOISTURE. MAXIMUM 6" LIFTS
6"
RCP LOCATION AND SIZE AS REQUIRED (MAX 36" DIA)
8" COMPACTED SUBGRADE OR FOUNDATION ROCK AS DIRECTED BY THE CITY OF LONGVIEW
SYNKO-FLEX WATERSTOP WITH PRIMER AROUND OUTSIDE OF PIPE AT ALL PIPE CONNECTIONS

SECTION A-A

NTS

NOTES:

1. CONCRETE SHALL BE 3,500 PSI AT 28 DAYS.
2. ALL EXPOSED CONCRETE EDGES SHALL HAVE 3/4" CHAMFER AND SHALL BE BROOM FINISHED.
3. ALL REINFORCING SHALL BE NEW, DEFORMED GRADE 60 STEEL.
4. REINFORCEMENT SHALL BE CONTINUOUS AT ALL JOINTS AND CORNERS.
5. REINFORCING BARS SHALL HAVE A MINIMUM OF 18" LAP AND SHALL BE TIED SECURELY WITH STEEL TIES AT ALL LAPS.
6. INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN).

	STORM DRAINAGE LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	10-FT CURB INLET PAGE 2 OF 3

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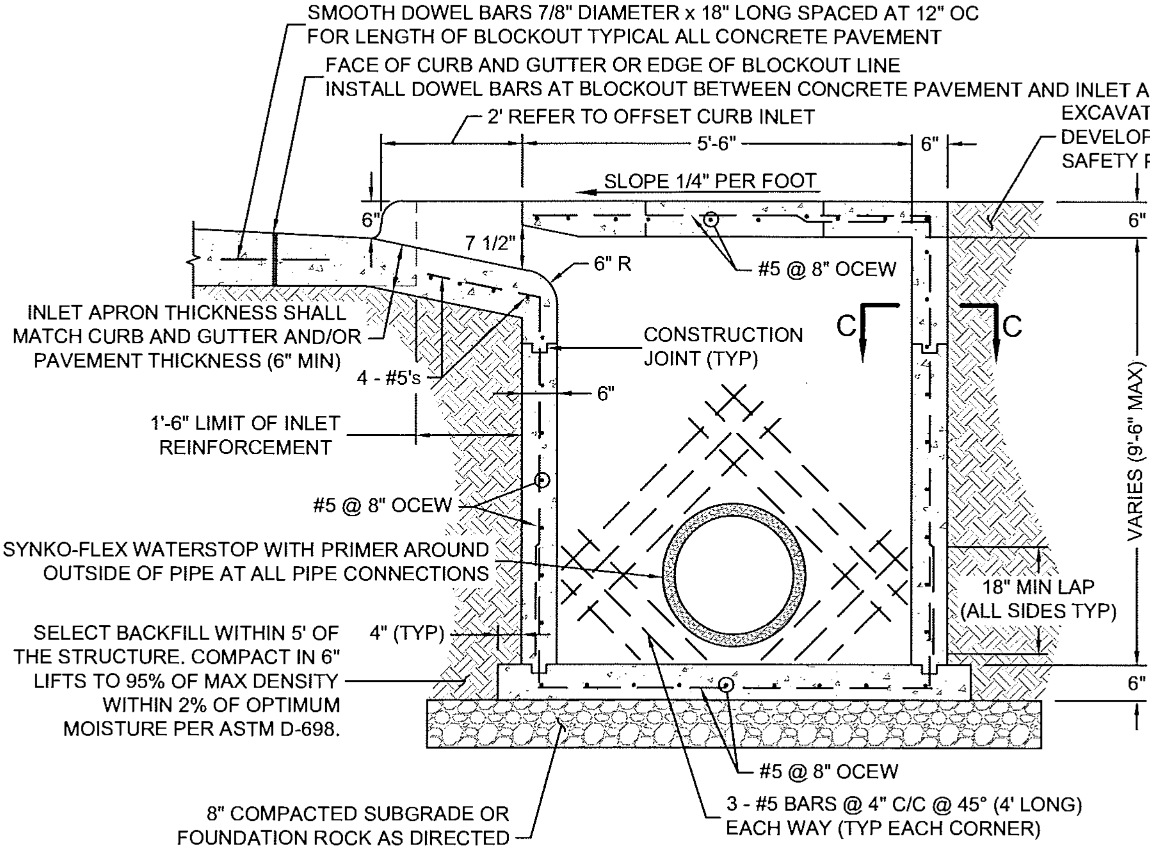
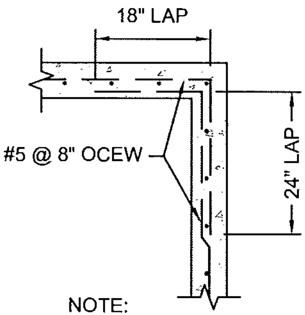

SMOOTH DOWEL BARS 7/8" DIAMETER x 18" LONG SPACED AT 12" OC FOR LENGTH OF BLOCKOUT TYPICAL ALL CONCRETE PAVEMENT
FACE OF CURB AND GUTTER OR EDGE OF BLOCKOUT LINE
INSTALL DOWEL BARS AT BLOCKOUT BETWEEN CONCRETE PAVEMENT AND INLET APRON
2' REFER TO OFFSET CURB INLET
5'-6"
6"
EXCAVATION PER DEVELOPER/CONTRACTOR SAFETY PLAN
SLOPE 1/4" PER FOOT
6"
7 1/2"
6"
#5 @ 8" OCEW
6" R
INLET APRON THICKNESS SHALL MATCH CURB AND GUTTER AND/OR PAVEMENT THICKNESS (6" MIN)
CONSTRUCTION JOINT (TYP)
C
C
4 - #5's
6"
1'-6" LIMIT OF INLET REINFORCEMENT
VARIES (9'-6" MAX)
#5 @ 8" OCEW
SYNKO-FLEX WATERSTOP WITH PRIMER AROUND OUTSIDE OF PIPE AT ALL PIPE CONNECTIONS
18" MIN LAP (ALL SIDES TYP)
SELECT BACKFILL WITHIN 5' OF THE STRUCTURE. COMPACT IN 6" LIFTS TO 95% OF MAX DENSITY WITHIN 2% OF OPTIMUM MOISTURE PER ASTM D-698.
4" (TYP)
6"
#5 @ 8" OCEW
8" COMPACTED SUBGRADE OR FOUNDATION ROCK AS DIRECTED BY THE CITY OF LONGVIEW
3 - #5 BARS @ 4" C/C @ 45° (4' LONG) EACH WAY (TYP EACH CORNER)

SECTION B-B

NTS


18" LAP
#5 @ 8" OCEW
24" LAP

NOTE:
MINIMUM 18" LAP ALL REINFORCEMENT.

SECTION C-C

NTS

	STORM DRAINAGE LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	10-FT CURB INLET PAGE 3 OF 3

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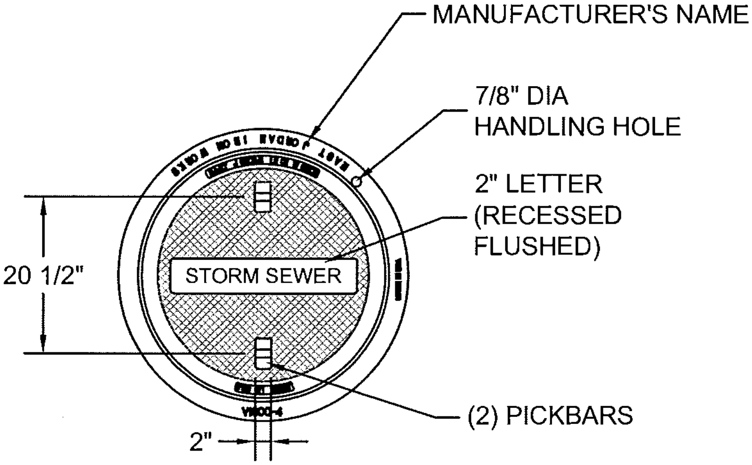
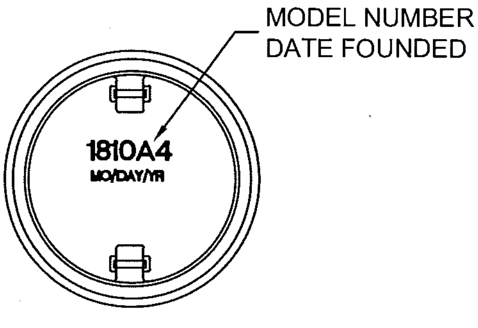
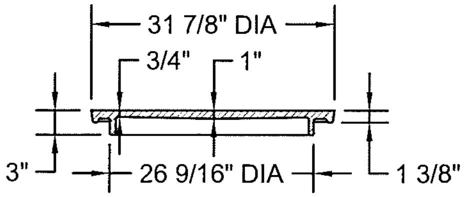
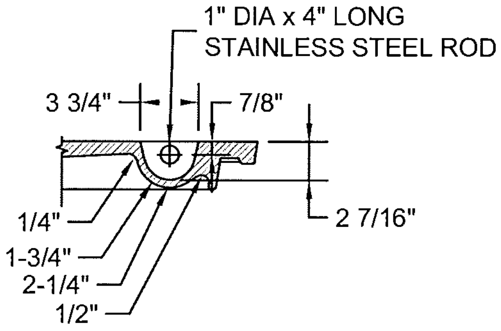

MANUFACTURER'S NAME
7/8" DIA
HANDLING HOLE
2" LETTER
(RECESSED
FLUSHED)
20 1/2"
STORM SEWER
(2) PICKBARS
2"


MODEL NUMBER
DATE FOUNDED
1810A4
MO/DAY/YR

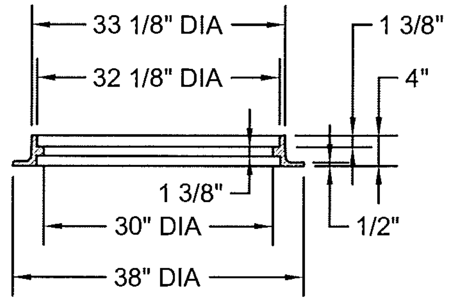
BOTTOM OF COVER


31 7/8" DIA
3/4"
1"
3"
26 9/16" DIA
1 3/8"

COVER SECTION


1" DIA x 4" LONG
STAINLESS STEEL ROD
3 3/4"
7/8"
1/4"
1-3/4"
2-1/4"
1/2"
2 7/16"

PICKBAR DETAIL


33 1/8" DIA
32 1/8" DIA
1 3/8"
4"
1 3/8"
30" DIA
1/2"
38" DIA

FRAME SECTION

NOTES:

1. MANHOLE RINGS AND COVERS SHALL BE MACHINED SURFACE CAST IRON, NON-ROCKING TYPE.
2. MINIMUM WEIGHT FOR STANDARD RING AND COVER SHALL BE 210 POUNDS.
3. COVER SHALL HAVE RECESS PICK SLOTS AND NO HOLES.

STORM
DRAINAGE

LATEST
REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

STORM DAINAGE
MANHOLE RING AND COVER

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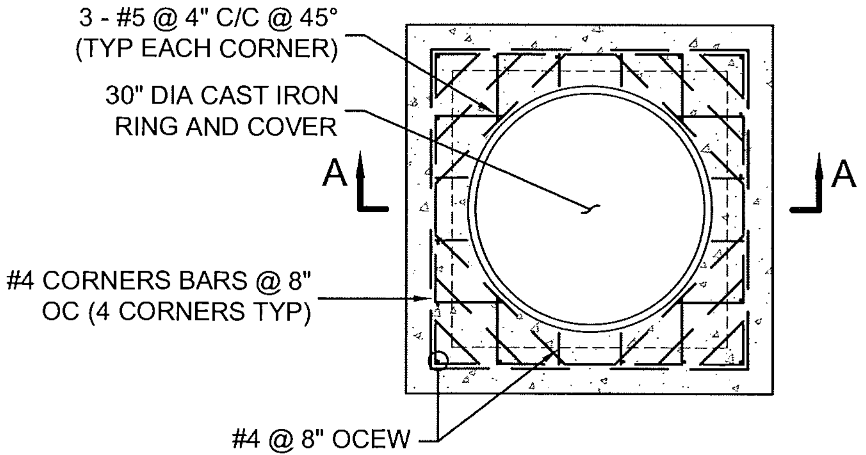
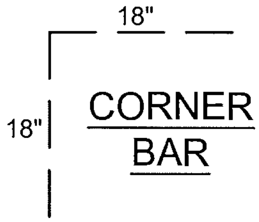
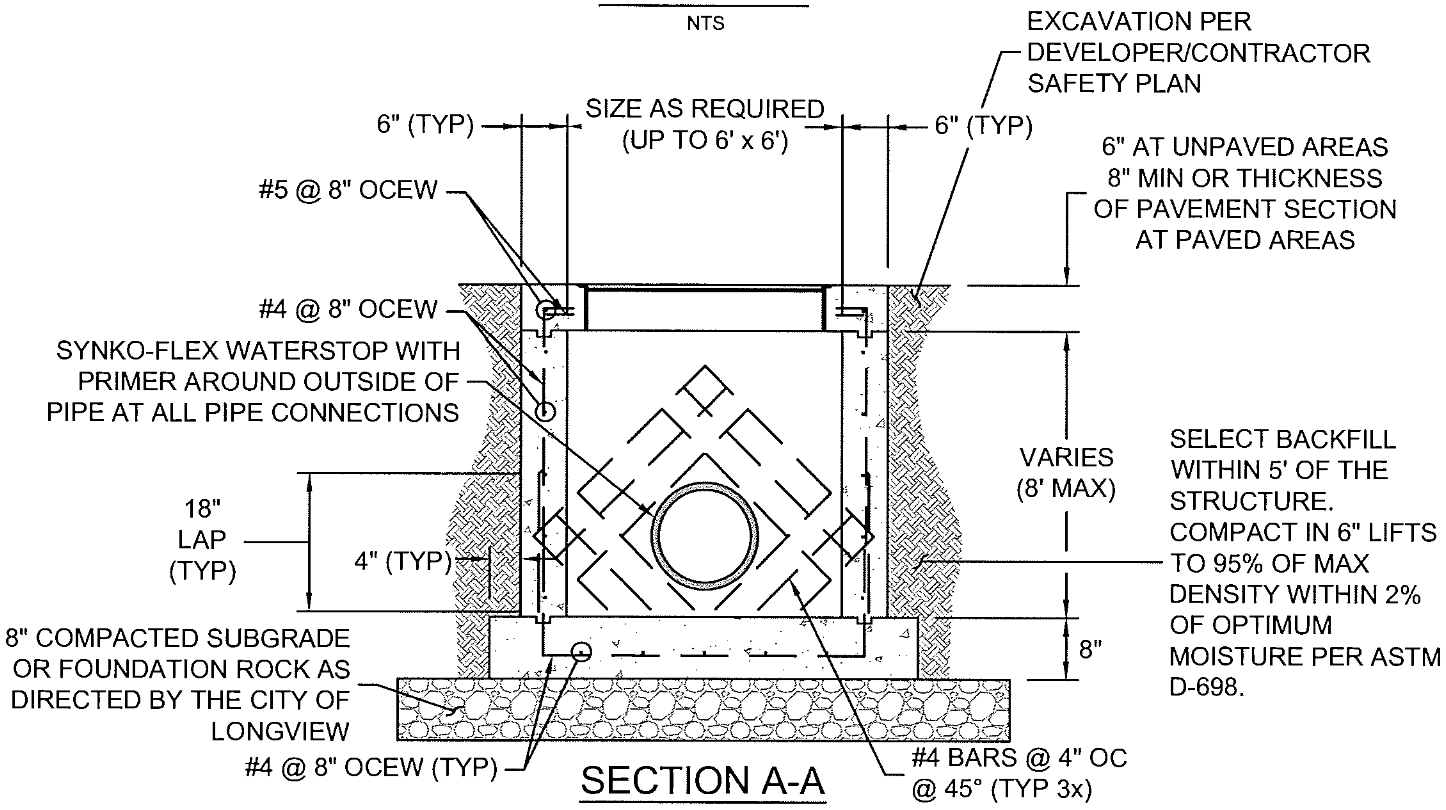

3 - #5 @ 4" C/C @ 45°
(TYP EACH CORNER)
30" DIA CAST IRON
RING AND COVER
A
A
#4 CORNERS BARS @ 8"
OC (4 CORNERS TYP)
#4 @ 8" OCEW

PLAN VIEW

NTS



CORNER BAR


EXCAVATION PER
DEVELOPER/CONTRACTOR
SAFETY PLAN
6" (TYP)
SIZE AS REQUIRED
(UP TO 6' x 6')
6" (TYP)
6" AT UNPAVED AREAS
8" MIN OR THICKNESS
OF PAVEMENT SECTION
AT PAVED AREAS
#5 @ 8" OCEW
#4 @ 8" OCEW
SYNKO-FLEX WATERSTOP WITH
PRIMER AROUND OUTSIDE OF
PIPE AT ALL PIPE CONNECTIONS
VARIES
(8' MAX)
SELECT BACKFILL
WITHIN 5' OF THE
STRUCTURE.
COMPACT IN 6" LIFTS
TO 95% OF MAX
DENSITY WITHIN 2%
OF OPTIMUM
MOISTURE PER ASTM
D-698.
18"
LAP
(TYP)
4" (TYP)
8"
8" COMPACTED SUBGRADE
OR FOUNDATION ROCK AS
DIRECTED BY THE CITY OF
LONGVIEW
#4 @ 8" OCEW (TYP)
#4 BARS @ 4" OC
@ 45° (TYP 3x)

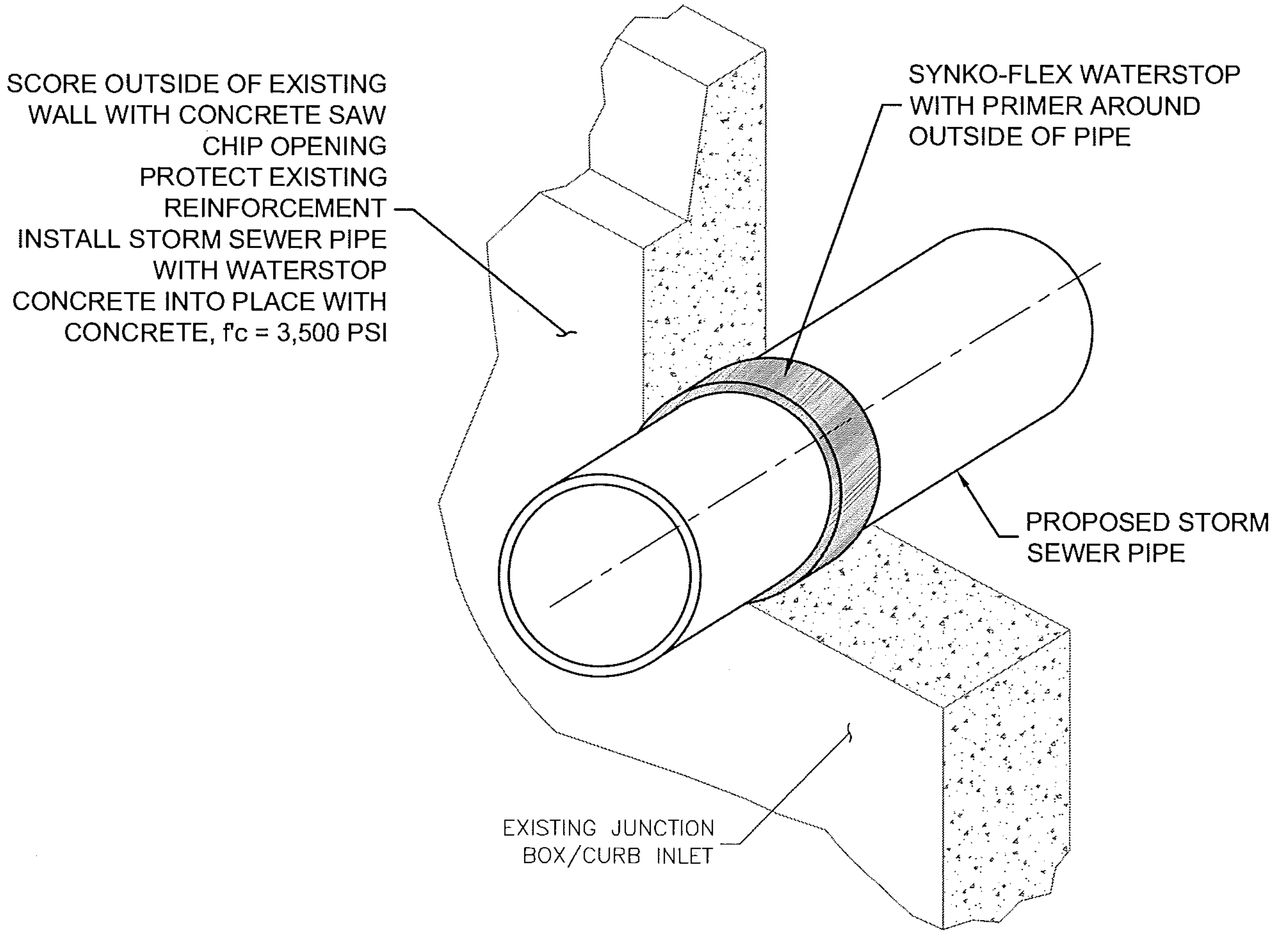
SECTION A-A

NTS

NOTES:

1. ALL CONCRETE SHALL BE CLASS A, 3500 PSI AT 28 DAY COMPRESSIVE STRENGTH.
2. ALL REINFORCING STEEL SHALL BE NEW, GRADE 60 WITH MIN 18" LAP. ALL REINFORCING SHALL BE CONTINUOUS WITH REQUIRED LAPS AT CORNERS AND JOINTS. TIE LAPS SECURELY WITH STEEL WIRE TIES.
3. ALL COVERS SHALL BE MINIMUM 210 LBS AND MEET THE STANDARD MANHOLE RING AND COVER DETAILS.
4. ALL EXPOSED CONCRETE EDGE SHALL BE CHAMFERED 3/4" AND ALL EXPOSED CONCRETE SHALL HAVE BROOM FINISH.

	STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	JUNCTION BOX
	LATEST REVISION: 3/21/2018		


SCORE OUTSIDE OF EXISTING
WALL WITH CONCRETE SAW
CHIP OPENING
PROTECT EXISTING
REINFORCEMENT
INSTALL STORM SEWER PIPE
WITH WATERSTOP
CONCRETE INTO PLACE WITH
CONCRETE, f'c = 3,500 PSI
SYNKO-FLEX WATERSTOP
WITH PRIMER AROUND
OUTSIDE OF PIPE
PROPOSED STORM
SEWER PIPE
EXISTING JUNCTION
BOX/CURB INLET

NOTES:

1. DRILL 1/2" TO 3/4" HOLES (SPACED 3" TO 4") AT PERIMETER OF PROPOSED OPENING TO PROTECT WALL FROM DAMAGE IF DIRECTED BY THE CITY OF LONGVIEW.

2. REINFORCEMENT DAMAGED DURING SCORING OR CHIPPING OR IF OPENING IS MORE THAN 5" LARGER THAN PIPE OD, INSTALL #5 REBAR AT 8" OCEW PRIOR TO CONCRETING OPENING. REBAR INSTALLATION SHALL BE APPROVED BY CITY OF LONGVIEW.

3. EXTEND CONCRETE FILL APPROXIMATELY 8" OUTSIDE THE EXISTING WALL WHEN FILLING THE PIPE OPENING TO SUPPORT PIPE AT WALL CONNECTION.

	STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	TIE - IN TO EXISTING BOX OR INLET
	LATEST REVISION: 3/21/2018		

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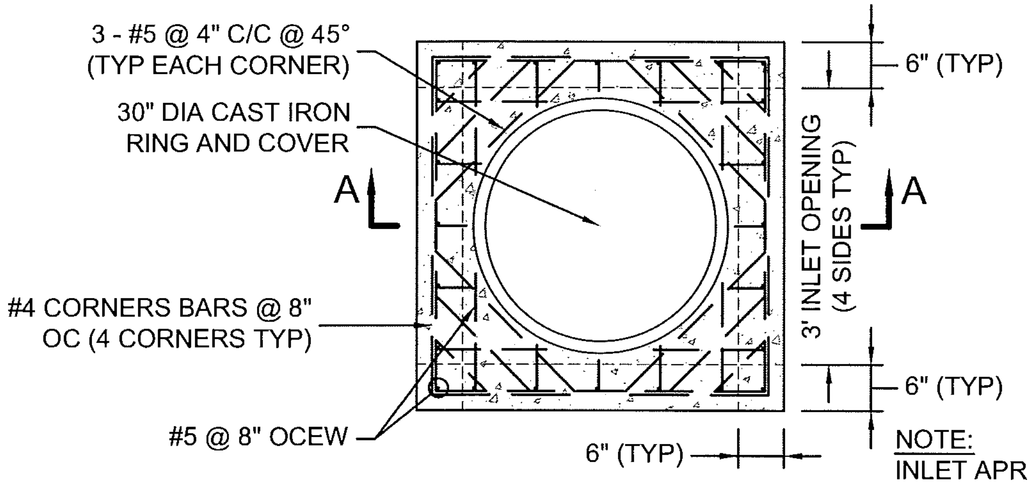
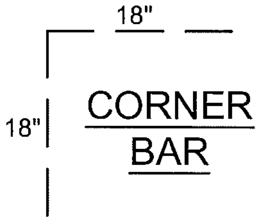

3 - #5 @ 4" C/C @ 45°
(TYP EACH CORNER)
30" DIA CAST IRON
RING AND COVER
A
A
#4 CORNERS BARS @ 8"
OC (4 CORNERS TYP)
#5 @ 8" OCEW
6" (TYP)
3' INLET OPENING
(4 SIDES TYP)
6" (TYP)
6" (TYP)

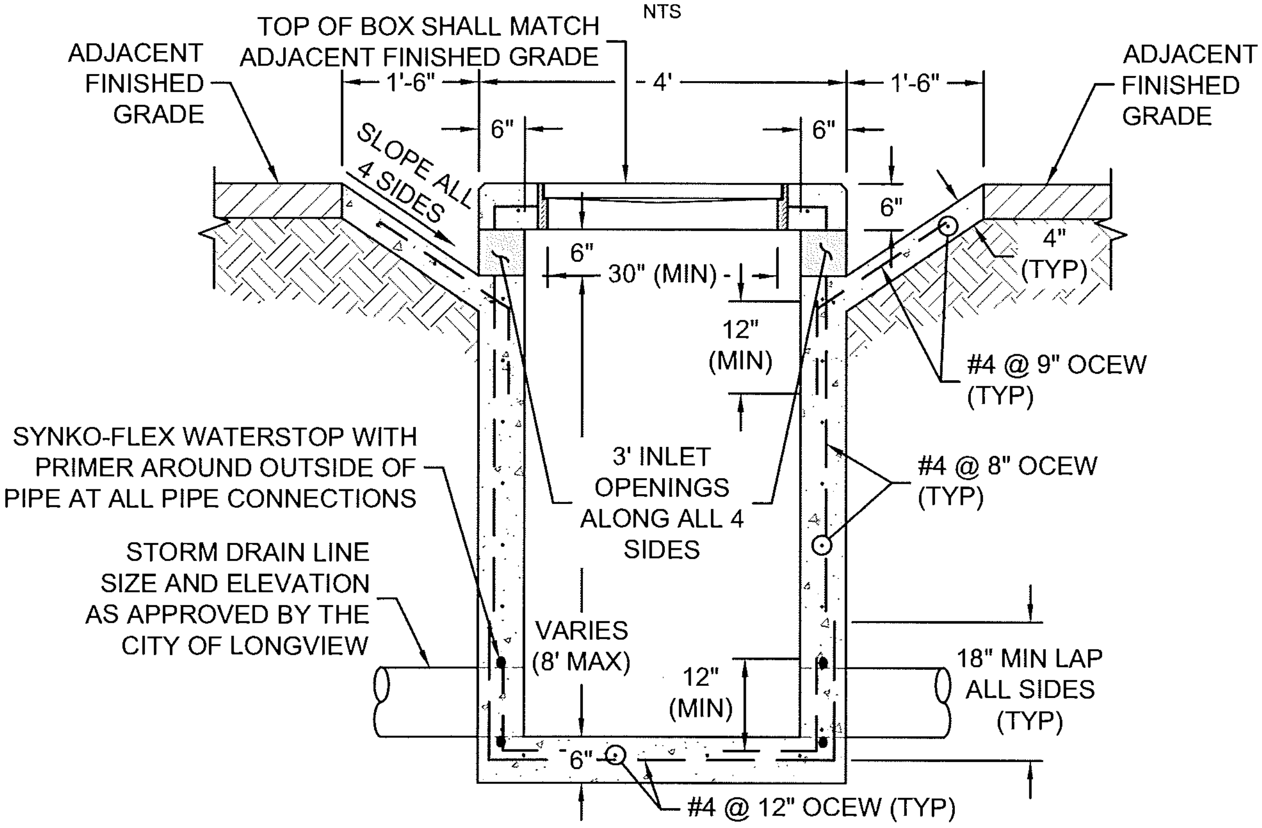
NOTE:
INLET APRON NOT
SHOWN FOR CLARITY.

PLAN VIEW

NTS



CORNER BAR


TOP OF BOX SHALL MATCH
ADJACENT FINISHED GRADE
ADJACENT
FINISHED
GRADE
1'-6"
4'
1'-6"
ADJACENT
FINISHED
GRADE
6"
6"
SLOPE ALL
4 SIDES
6"
6"
30" (MIN)
4"
(TYP)
12"
(MIN)
#4 @ 9" OCEW
(TYP)
SYNKO-FLEX WATERSTOP WITH
PRIMER AROUND OUTSIDE OF
PIPE AT ALL PIPE CONNECTIONS
3' INLET
OPENINGS
ALONG ALL 4
SIDES
#4 @ 8" OCEW
(TYP)
STORM DRAIN LINE
SIZE AND ELEVATION
AS APPROVED BY THE
CITY OF LONGVIEW
VARIES
(8' MAX)
12"
(MIN)
18" MIN LAP
ALL SIDES
(TYP)
6"
#4 @ 12" OCEW (TYP)

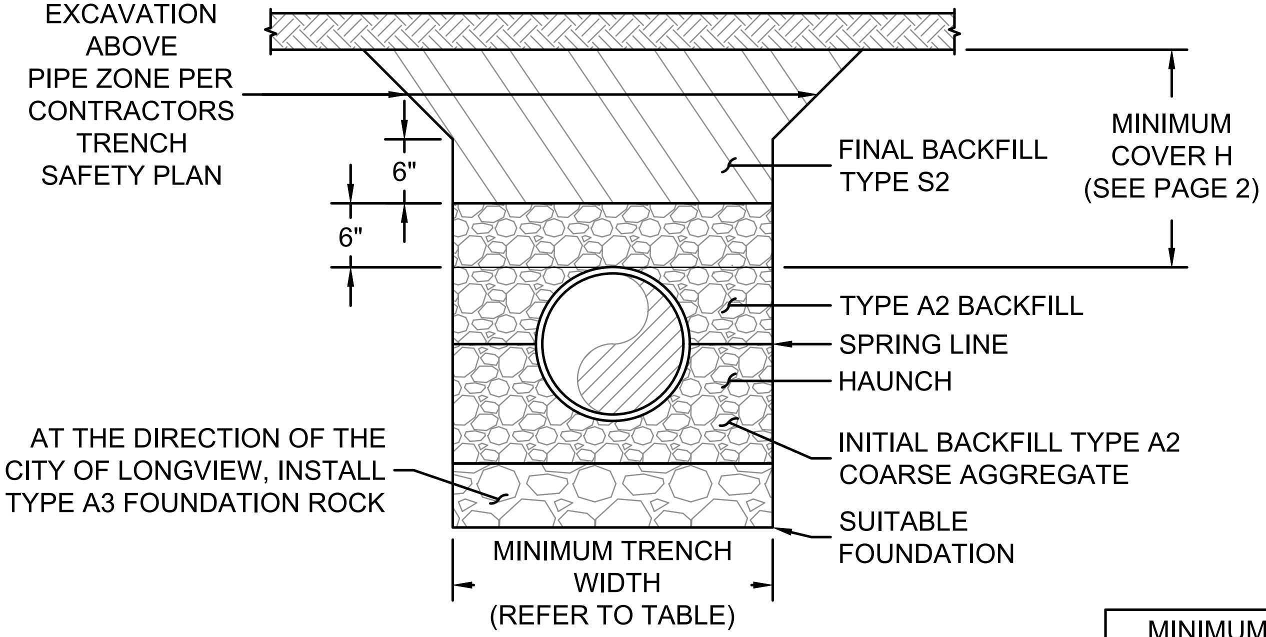
SECTION A-A

NTS

NOTES:

1. ALL CONCRETE SHALL BE CLASS A, 3,500 PSI AT 28 DAY COMPRESSIVE STRENGTH.
2. ALL REINFORCING STEEL SHALL BE NEW, GRADE 60 WITH MIN 18" BAR LAP. ALL REINFORCING SHALL BE CONTINUOUS WITH REQUIRED LAP AT CORNERS AND JOINTS. TIE LAPS SECURELY WITH STEEL WIRE TIES.
3. ALL RINGS AND COVERS SHALL BE MINIMUM 210 LBS AND MEET THE STANDARD MANHOLE RING AND COVER DETAILS.
4. ALL EXPOSED CONCRETE EDGE SHALL BE CHAMFERED 3/4" AND ALL EXPOSED CONCRETE SHALL HAVE BROOM FINISH.

	STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	AREA INLET
	LATEST REVISION: 3/21/2018		


EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
6"
6"
FINAL BACKFILL TYPE S2
MINIMUM COVER H (SEE PAGE 2)
TYPE A2 BACKFILL
SPRING LINE
HAUNCH
INITIAL BACKFILL TYPE A2 COARSE AGGREGATE
AT THE DIRECTION OF THE CITY OF LONGVIEW, INSTALL TYPE A3 FOUNDATION ROCK
SUITABLE FOUNDATION
MINIMUM TRENCH WIDTH (REFER TO TABLE)

MINIMUM TRENCH WIDTHS	
PIPE DIAMETER	MINIMUM TRENCH WIDTHS
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
60"	96"

MINIMUM COVER BASED ON VEHICLE LOADING CONDITIONS		
	SURFACE LIVE LOADING CONDITION	
PIPE DIAMETER	H-25	HEAVY CONSTRUCTION (75T AXLE LOAD)*
12" - 48"	12"	48"
60"	24"	60"

*VEHICLES IN EXCESS OF 75T MAY REQUIRE ADDITIONAL COVER.

NOTES:

1. HDPE DRAINAGE PIPE SHALL BE DOUBLE WALL WITH SMOOTH INTERIOR SURFACE. HDPE PIPE MAY BE USED IN UNPAVED AREAS ONLY WITH THE APPROVAL OF THE CITY OF LONGVIEW.
2. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, EXCAVATE TO A DEPTH REQUIRED BY THE CITY OF LONGVIEW AND REPLACE WITH TYP A3 COURSE STONE 1" TO 3" MIN 90% RETAINED ON A 1" SIEVE.
4. BEDDING AND INITIAL BACKFILL: TYPE A2 ANGULAR ROCK 3/4" TO 1" MEETING ASTM C-33 NO. 57 CLEAN, WASHED, SOUND DURABLE, AND WELL GRADED. PROVIDE DOCUMENTATION FOR MATERIAL TO THE CITY OF LONGVIEW. UNLESS OTHERWISE NOTED BY THE CITY OF LONGVIEW, MINIMUM BEDDING THICKNESS SHALL BE 4" FOR 4"-24"; 6" FOR 30"-60" AND SHALL EXTEND UP TO 6" ABOVE PIPE.
5. FINAL BACKFILL: SOIL TYPE S2 GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2" EXCESSIVE SILTS AND DEBRIS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, OR OTHER ORGANIC MATTER. SOILS SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III WITH ALL LESS THAN 40 AND A PI LESS THAN 20 BUT GREATER THAN 4. COMPACT IN 6" LIFTS TO 95% OF MAXIMUM DENSITY WITHIN 2% OF OPTIMUM MOISTURE PER ASTM D-698. PROVIDE DOCUMENTATION FOR MATERIAL TO THE CITY OF LONGVIEW.

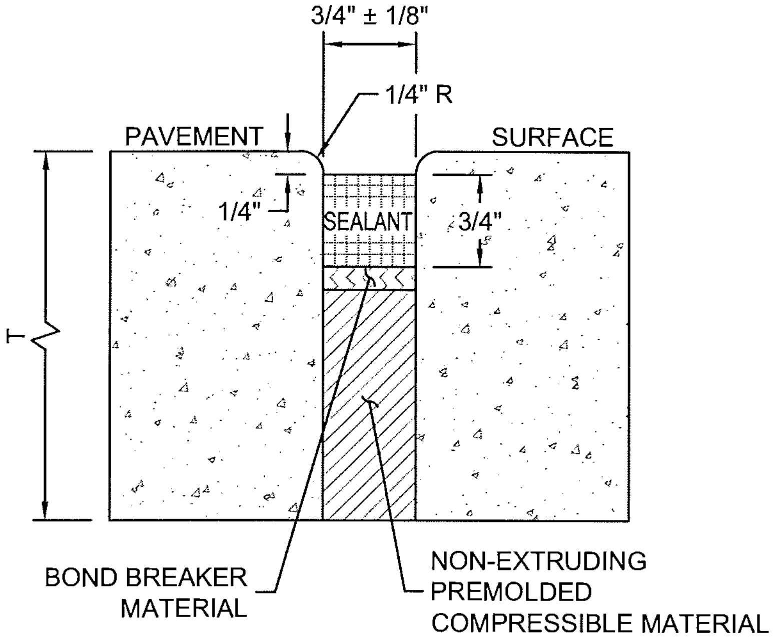
MINIMUM COVER:

MINIMUM COVER, H, IN NON-TRAFFIC LOCATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER IS REQUIRED TO PREVENT FLOTATION IS AREAS OF HIGH GROUNDWATER OR FLOODING. FOR TRAFFIC LOCATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF PAVEMENT SECTION. ADDITIONAL COVER IS REQUIRED TO PREVENT FLOATATION IN AREAS OF HIGH GROUNDWATER OR FLOODING.

LATEST REVISION:
10/24/2024

CITY OF LONGVIEW, TEXAS
STANDARD DETAIL

DOUBLE WALL HDPE PIPE
INSTALLATION


3/4" ± 1/8"
1/4" R
PAVEMENT
SURFACE
1/4"
SEALANT
3/4"
T
BOND BREAKER MATERIAL
NON-EXTRUDING PREMOLDED COMPRESSIBLE MATERIAL

NOTE:

DIMENSIONS MAY VARY WITH SEALANT MANUFACTURER'S WIDTH-TO-DEPTH RATIO REQUIREMENTS. ACTUAL DIMENSION AND MATERIALS SHALL BE APPROVED BY CITY OF LONGVIEW.

	STORM DRAINAGE	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	JOINT SEALING
	LATEST REVISION: 3/21/2018		

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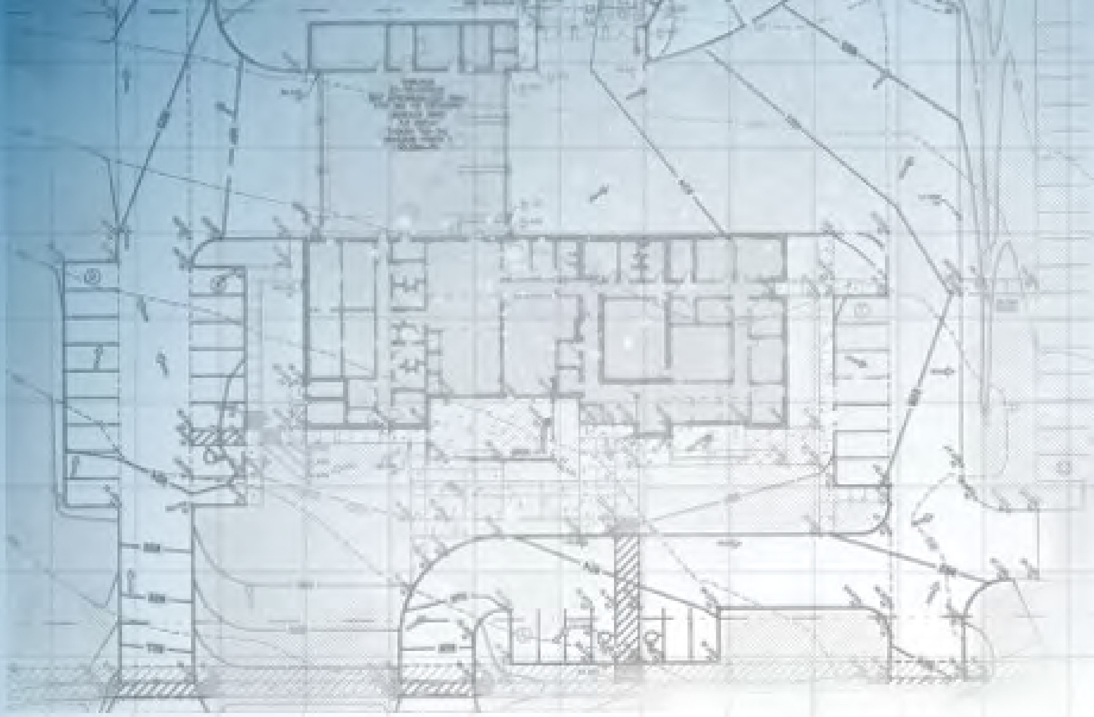
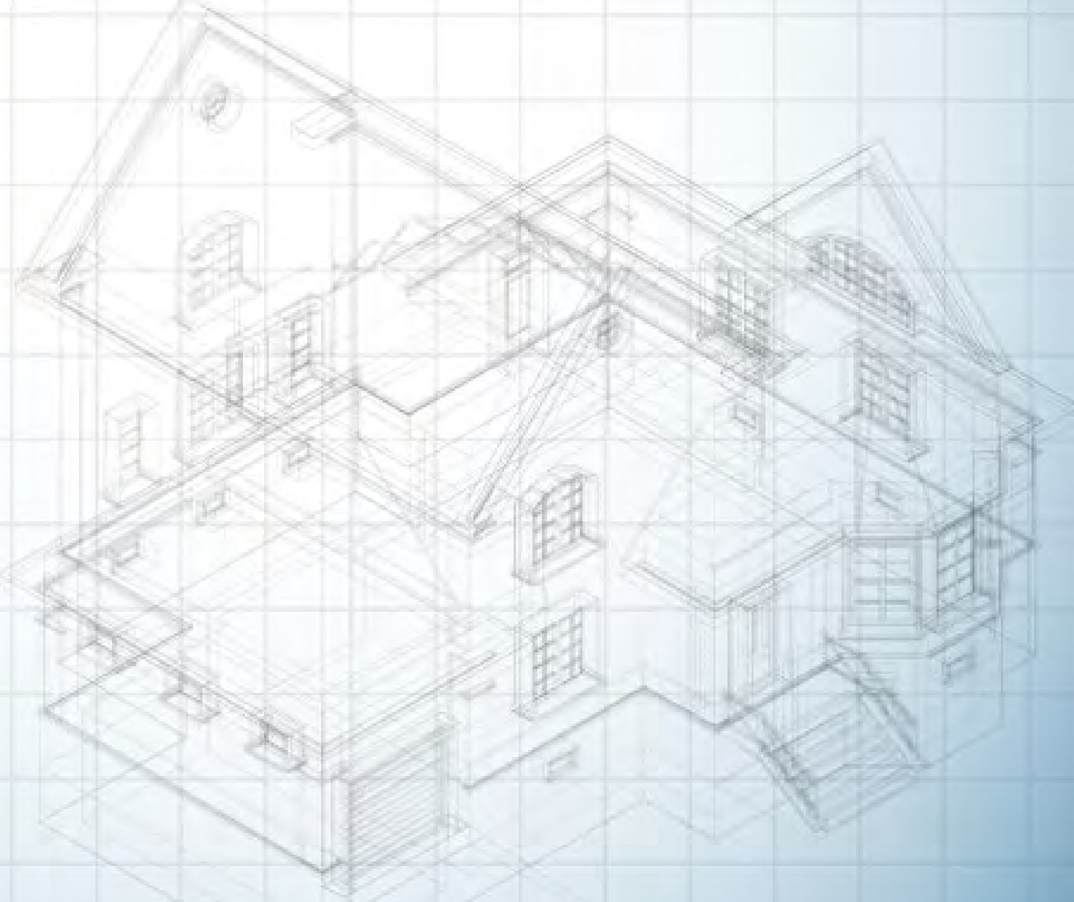
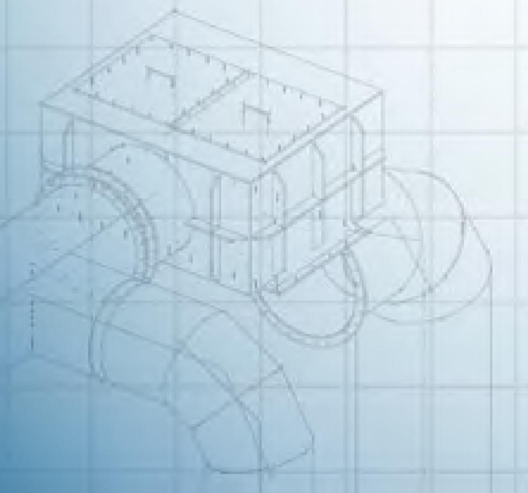


Engineering Details - Streets



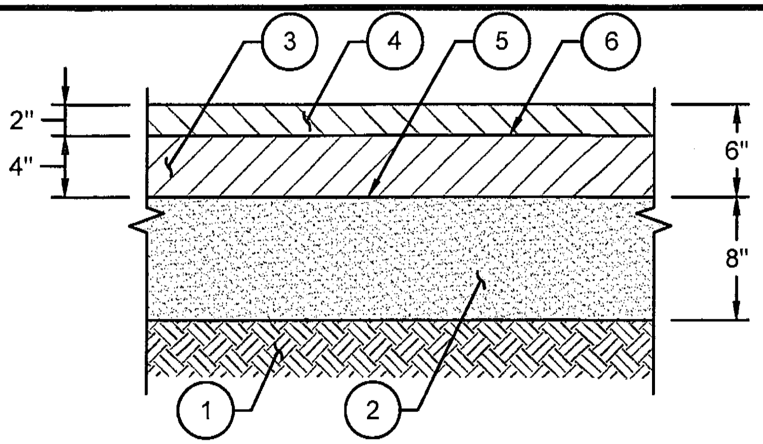


STREET DETAILS

Residential (Local) Street 6-in HMAC Pavement Section 4
Residential (Local) Street 6-in Concrete Pavement Section 5
Residential (Collector) Street 7-in HMAC Pavement Section 6
Residential (Collector) Street 7-in Concrete Pavement Section 7
Curb and Gutter 8
Monolithic Curb and Gutter 9
Curb and Gutter Joints 10
Curb and Gutter Pavement Tie-In 11
Residential (Local) Street Joint Layout 12
Residential (Collector) Street Joint Layout 13
Longitudinal Joints 14
Transverse Joints 15
Transverse Expansion Joints 16
Joint Sealing 17
Sawcut and Repair Asphalt Road Pavement 18
Sawcut and Repair Concrete Pavement 19
Temporary Pavement Repair 20
Asphalt Driveway at Asphalt Street 21
Concrete Driveway at Concrete Street 22
Concrete Driveway at Asphalt Street 23
Concrete Driveway 24
Pavement Repair at Manhole 25
Concrete Valley Gutter 26

NOTES:

1. PAVEMENT SECTION SHOWN IS MINIMUM SECTION ALLOWED FOR RESIDENTIAL STREET. DESIGN CONDITIONS VARY. PAVEMENT SECTION SHALL BE INCREASED AS DIRECTED BY THE CITY OF LONGVIEW AS CONDITIONS REQUIRE.
2. ALL RESIDENTIAL STREETS SHALL HAVE CURB AND GUTTER UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
3. TREATED SUBGRADE SHALL EXTEND 2' BEYOND THE PROPOSED BACK OF CURB FOR CURBED PAVEMENT AND 2' BEYOND THE EDGE OF PAVEMENT FOR NON-CURBED PAVEMENT.



MARK	DESCRIPTION

① REMOVE ALL VEGETATION AND DEBRIS PRIOR TO BEGINNING EMBANKMENT. SCARIFY GROUND SURFACE TO 8" AND RECOMPACT TO 95% OF STANDARD PROCTOR (ASTM D-698). PROOF ROLL, TxDOT ITEM 216, ALL AREAS PRIOR TO PLACEMENT OF EMBANKMENT TO DETECT ANY AREAS OF WEAKNESS AND REPLACE WITH FOUNDATION MATERIAL AT CITY OF LONGVIEW'S DIRECTION. AT TIME OF COMPACTION, THE MOISTURE CONTENT OF THE SOIL SHALL BE AS FOLLOWS:

SOIL DESCRIPTION	PLASTICITY INDEX (PI)	MOISTURE CONTENT AT TIME OF COMPACTION
NON-PLASTIC SILTY SAND SOILS	PI<15	+/- 3%
SANDY CLAY SOILS	15<PI<25	-1% TO +3%
CLAY SOILS	PI>25	-1% TO +3%

INSTALL FILL FOR EMBANKMENT IN 8" LIFTS, COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698). MOISTURE CONTENT SHALL BE AS DESCRIBED ABOVE AT THE TIME OF COMPACTION. SELECT FILL SHALL BE ON-SITE CLAYEY SOILS OR OFF-SITE MATERIAL. OFF-SITE MATERIAL SHALL BE FREE OF ORGANIC MATTER, OR ROCK FRAGMENTS LARGER THAN 2" IN ANY DIRECTION AND POSSES A PLASTICITY INDEX BETWEEN 10 AND 45, WITH A LIQUID LIMIT OF 70 OR LESS. THE FIRST LIFT OF FILL SHALL BE PLACED WITHIN 48 HOURS OF SATISFACTORY COMPACTION OF THE UNDERLYING SUBGRADE SOILS.

BLEND THE SUBGRADE SOILS TO A DEPTH OF 12" OVER THE PHASE TO OBTAIN A UNIFORMLY CONSISTENT PLASTICITY INDEX PRIOR TO LIME STABILIZATION.

② 8" OF SUBGRADE SHALL BE STABILIZED WITH LIME OR CEMENT DEPENDING UPON THE PREDOMINANT SUBGRADE SOILS PLASTICITY INDEX AS INDICATED BELOW:
LIME TREATMENT OF CLAY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 260. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. LIME SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. A MINIMUM OF SIX PERCENT (6%) HYDRATED LIME SHOULD BE USED TO TREAT SANDY CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) BETWEEN 16 AND 25. A MINIMUM OF EIGHT PERCENT (8%) HYDRATED LIME SHOULD BE USED TO TREAT CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 26 OR GREATER. LIME STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ ±3% OF OPTIMUM MOISTURE. THE REQUIRED APPLICATION RATES ARE OUTLINED BELOW:

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	LIME REQUIRED (LBS/SY)
16 TO 25	6	8	42
≥26	8	8	54

CEMENT TREATMENT OF SANDY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 275. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. CEMENT SHOULD BE ADDED ONLY TO THAT AREA WHERE THE MIXING, COMPACTION AND FINE GRADING CAN BE COMPLETED IN DAYLIGHT WITHIN TWO (2) HOURS OF APPLICATION, AND IN ONE CONTINUOUS OPERATION. A MINIMUM OF FOUR PERCENT (4%) TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE USED TO TREAT SANDY AND/OR SILTY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 15 OR LESS. THE REQUIRED APPLICATION RATE FOR A FOUR PERCENT (4%) TREATMENT DEPTH OF EIGHT (8) INCHES IS OUTLINED BELOW BASED ON THE PLASTICITY INDEX (PI) OF THE PREDOMINANT SUBGRADE SOILS. CEMENT STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ -4% TO +1% OF OPTIMUM MOISTURE

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	CEMENT REQUIRED (LBS/SY)
≥15	4	8	30

③ 4" OF HMAC INSTALLED IN ONE 4" LIFT, TxDOT ITEM 340, TYPE A OR B COMPACTED USING AIR VOID CONTROL METHOD.

④ 2" OF HMAC, TxDOT ITEM 340, TYPE D, COMPACTED USING AIR VOID CONTROL METHOD.

⑤ MC-30 PRIME COAT APPLIED AT A MAXIMUM RATE OF 0.25 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF, AND THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS.

⑥ CRS-2H TACK COAT MECHANICALLY APPLIED AT A MAXIMUM RATE OF 0.10 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF, AND THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS. TACK COAT SHALL BE APPLIED BETWEEN ALL LAYERS OF HMAC.

STREETS

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

RESIDENTIAL (LOCAL) STREET 6" HMAC PAVEMENT SECTION

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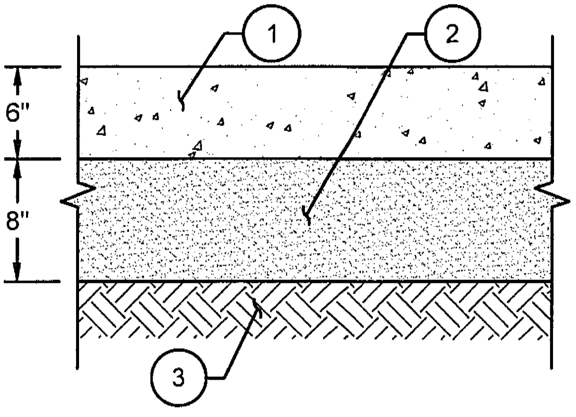
NOTES:

1. PAVEMENT DESIGN SHALL BE CONCRETE PAVEMENT CONTRACTION DESIGN (CPCD), JOINTED CONCRETE PAVEMENT. ALTERNATE PAVEMENT DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY OF LONGVIEW.

2. PAVEMENT SECTION SHOWN IS THE MINIMUM SECTION ALLOWED FOR RESIDENTIAL STREETS. DESIGN CONDITIONS VARY. PAVEMENT SECTION SHALL BE INCREASED AS DIRECTED BY THE CITY OF LONGVIEW AS CONDITIONS REQUIRE.

3. ALL CONCRETE PAVEMENT SHALL HAVE MONOLITHIC CURB UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.

4. TREATED SUBGRADE SHALL EXTEND 2' BEYOND THE PROPOSED BACK OF CURB FOR CURBED PAVEMENT SECTION AND 2' BEYOND THE EDGE OF PAVEMENT FOR NON-CURBED PAVEMENT.



MARK	DESCRIPTION
①	6" PORTLAND CEMENT CONCRETE PAVEMENT. PAVEMENT SHALL BE TxDOT CLASS P HAVING A MINIMUM 4400 PSI COMPRESSIVE STRENGTH AT 28 DAYS (MINIMUM 6 SACKS PER CUBIC YARD), WITH SMOOTH #7 DOWEL BARS ALONG ALL TRANSVERSE JOINTS (18" LONG AT MINIMUM 12" SPACING OC), AND DEFORMED #4 TIE BARS ALONG ALL LONGITUDINAL JOINTS (36" LONG AT MINIMUM 24" SPACING OC). TRAVERSE AND LONGITUDINAL JOINTS SHALL HAVE A MAXIMUM SPACING OF 12' ON CENTER.

② 8" OF SUBGRADE SHALL BE STABILIZED WITH LIME OR CEMENT DEPENDING UPON THE PREDOMINANT SUBGRADE SOILS PLASTICITY INDEX AS INDICATED BELOW:

LIME TREATMENT OF CLAY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 260. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. LIME SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. A MINIMUM OF SIX PERCENT (6%) HYDRATED LIME SHOULD BE USED TO TREAT SANDY CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) BETWEEN 16 AND 25. A MINIMUM OF EIGHT PERCENT (8%) HYDRATED LIME SHOULD BE USED TO TREAT CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 26 OR GREATER. LIME STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ ±3% OF OPTIMUM MOISTURE. THE REQUIRED APPLICATION RATES ARE OUTLINED BELOW:

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	LIME REQUIRED (LBS/SY)
16 TO 25	6	8	42
≥26	8	8	54

CEMENT TREATMENT OF SANDY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 275. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. CEMENT SHOULD BE ADDED ONLY TO THAT AREA WHERE THE MIXING, COMPACTION AND FINE GRADING CAN BE COMPLETED IN DAYLIGHT WITHIN TWO (2) HOURS OF APPLICATION, AND IN ONE CONTINUOUS OPERATION. A MINIMUM OF FOUR PERCENT (4%) TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE USED TO TREAT SANDY AND/OR SILTY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 15 OR LESS. THE REQUIRED APPLICATION RATE FOR A FOUR PERCENT (4%) TREATMENT DEPTH OF EIGHT (8) INCHES IS OUTLINED BELOW BASED ON THE PLASTICITY INDEX (PI) OF THE PREDOMINANT SUBGRADE SOILS. CEMENT STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ -4% TO +1% OF OPTIMUM MOISTURE.

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	CEMENT REQUIRED (LBS/SY)
≥15	4	8	30

③ REMOVE ALL VEGETATION AND DEBRIS PRIOR TO BEGINNING EMBANKMENT. SCARIFY GROUND SURFACE TO 8" AND COMPACT TO 95% OF MAXIMUM DENSITY PER ASTM D-698 STANDARD PROCTOR. PROOF ROLL COMPACTED SUBGRADE PER TxDOT ITEM 216 PRIOR TO PLACEMENT OF EMBANKMENT TO DETECT ANY AREAS OF WEAKNESS AND REPLACE WITH FOUNDATION MATERIAL AS DIRECTED BY THE CITY OF LONGVIEW. DURING COMPACTION, THE MOISTURE CONTENT OF THE SOIL SHALL BE AS FOLLOWS:

SOIL DESCRIPTION	PLASTICITY INDEX (PI)	MOISTURE CONTENT AT TIME OF COMPACTION
NON-PLASTIC SILTY SAND SOILS	PI<15	+/- 3%
SANDY CLAY SOILS	15<PI<25	-1% TO +3%
CLAY SOILS	PI>25	-1% TO +3%

INSTALL FILL FOR EMBANKMENT IN 8" LIFTS, COMPACTED IN HORIZONTAL LIFTS TO A MINIMUM OF 95% OF MAXIMUM DENSITY PER ASTM D-698 STANDARD PROCTOR. MOISTURE CONTENT SHALL BE AS DESCRIBED ABOVE DURING COMPACTION. SELECT FILL SHALL BE ON-SITE CLAYEY SANDY SOILS OR OFF-SITE MATERIAL. MATERIAL SHALL BE FREE OF ORGANIC MATTER OR ROCK FRAGMENTS LARGER THAN 2" IN ANY DIRECTION AND POSSES A PLASTICITY INDEX BETWEEN 10 AND 45, WITH A LIQUID LIMIT OF 70 OR LESS. THE FIRST LIFT OF FILL SHALL BE PLACED WITHIN 48 HOURS OF SATISFACTORY COMPACTION OF THE UNDERLYING SUBGRADE SOILS.

IF DIRECTED BY THE CITY OF LONGVIEW, BLEND THE SUBGRADE SOILS TO A DEPTH OF 12" OVER THE PROJECT AREA TO OBTAIN A UNIFORMLY CONSISTENT PLASTICITY INDEX PRIOR TO LIME OR CEMENT STABILIZATION.

	STREETS LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	RESIDENTIAL (LOCAL) STREET 6" CONCRETE PAVEMENT SECTION

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - ST - PVMT - CONC - SECT - 6".dwg

NOTES:

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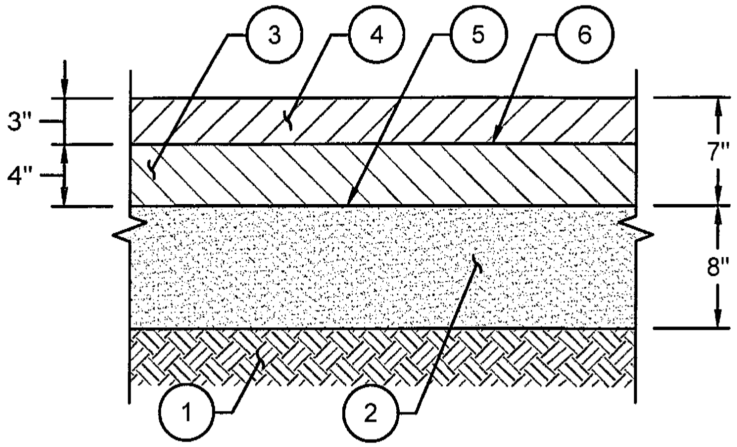

MARK DESCRIPTION

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PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	LIME REQUIRED (LBS/SY)
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PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	CEMENT REQUIRED (LBS/SY)
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③ 4" OF HMAC INSTALLED IN ONE 4" LIFT, TxDOT ITEM 340, TYPE A OR B COMPACTED USING AIR VOID CONTROL METHOD.

④ 3" OF HMAC, TxDOT ITEM 340, TYPE D, COMPACTED USING AIR VOID CONTROL METHOD.

⑤ MC-30 PRIME COAT APPLIED AT A MAXIMUM RATE OF 0.25 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF, AND THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS.

⑥ CRS-2H TACK COAT MECHANICALLY APPLIED AT A MAXIMUM RATE OF 0.10 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF, AND THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS. TACK COAT SHALL BE APPLIED BETWEEN ALL LAYERS OF HMAC.

STREETS

LATEST
REVISION:
3/16/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

RESIDENTIAL (COLLECTOR)
STREET 7" HMAC
PAVEMENT SECTION

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - ST - PVMT - HMAC - TRANS - 7".dwg

NOTES:

1. PAVEMENT DESIGN SHALL BE CONCRETE PAVEMENT CONTRACTION DESIGN (CPCD), JOINTED CONCRETE PAVEMENT. ALTERNATE PAVEMENT DESIGN MUST BE SUBMITTED AND APPROVED BY THE CITY OF LONGVIEW.

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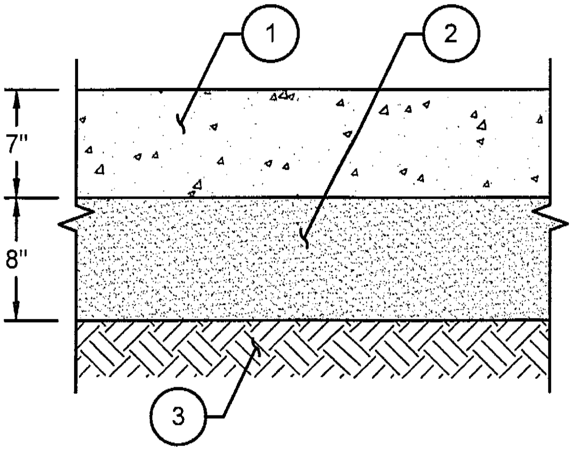

MARK — DESCRIPTION

① 7" PORTLAND CEMENT CONCRETE PAVEMENT. PAVEMENT SHALL BE TxDOT CLASS P HAVING A MINIMUM 4400 PSI COMPRESSIVE STRENGTH AT 28 DAYS (MINIMUM 6 SACKS PER CUBIC YARD), WITH SMOOTH #8 DOWEL BARS ALONG ALL TRANSVERSE JOINTS (18" LONG AT MINIMUM 12" SPACING OC), AND DEFORMED #5 TIE BARS ALONG ALL LONGITUDINAL JOINTS (42" LONG AT MINIMUM 24" SPACING OC). TRAVERSE AND LONGITUDINAL JOINTS SHALL HAVE A MAXIMUM SPACING OF 15' ON CENTER.

② 8" OF SUBGRADE SHALL BE STABILIZED WITH LIME OR CEMENT DEPENDING UPON THE PREDOMINANT SUBGRADE SOILS PLASTICITY INDEX AS INDICATED BELOW:
LIME TREATMENT OF CLAY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 260. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. LIME SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. A MINIMUM OF SIX PERCENT (6%) HYDRATED LIME SHOULD BE USED TO TREAT SANDY CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) BETWEEN 16 AND 25. A MINIMUM OF EIGHT PERCENT (8%) HYDRATED LIME SHOULD BE USED TO TREAT CLAY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 26 OR GREATER. LIME STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ ±3% OF OPTIMUM MOISTURE. THE REQUIRED APPLICATION RATES ARE OUTLINED BELOW:

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	LIME REQUIRED (LBS/SY)
16 TO 25	6	8	42
≥26	8	8	54

CEMENT TREATMENT OF SANDY SUBGRADE SOILS SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH TxDOT ITEM 275. THE COMPACTION REQUIREMENTS INDICATED BELOW SHOULD BE SPECIFIED IN LIEU OF THE REQUIREMENTS RECOMMENDED BY TxDOT. TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL SURFACE VEGETATION AND DEBRIS. CEMENT SHOULD BE ADDED ONLY TO THAT AREA WHERE THE MIXING, COMPACTION AND FINE GRADING CAN BE COMPLETED IN DAYLIGHT WITHIN TWO (2) HOURS OF APPLICATION, AND IN ONE CONTINUOUS OPERATION. A MINIMUM OF FOUR PERCENT (4%) TYPE I, TYPE II, OR TYPE I/II PORTLAND CEMENT SHOULD BE USED TO TREAT SANDY AND/OR SILTY SUBGRADE SOILS HAVING A PLASTICITY INDEX (PI) OF 15 OR LESS. THE REQUIRED APPLICATION RATE FOR A FOUR PERCENT (4%) TREATMENT DEPTH OF EIGHT (8) INCHES IS OUTLINED BELOW BASED ON THE PLASTICITY INDEX (PI) OF THE PREDOMINANT SUBGRADE SOILS. CEMENT STABILIZED SUBGRADE SHALL BE COMPACTED TO A MINIMUM OF 95% OF STANDARD PROCTOR (ASTM D-698) @ -4% TO +1% OF OPTIMUM MOISTURE.

PLASTICITY INDEX (PI)	APPLICATION (%)	DEPTH OF TREATMENT (INCHES)	CEMENT REQUIRED (LBS/SY)
≥15	4	8	30

③ REMOVE ALL VEGETATION AND DEBRIS PRIOR TO BEGINNING EMBANKMENT. SCARIFY GROUND SURFACE TO 8" AND COMPACT TO 95% OF MAXIMUM DENSITY PER ASTM D-698 STANDARD PROCTOR. PROOF ROLL COMPACTED SUBGRADE PER TxDOT ITEM 216 PRIOR TO PLACEMENT OF EMBANKMENT TO DETECT ANY AREAS OF WEAKNESS AND REPLACE WITH FOUNDATION MATERIAL AS DIRECTED BY THE CITY OF LONGVIEW. DURING COMPACTION, THE MOISTURE CONTENT OF THE SOIL SHALL BE AS FOLLOWS:

SOIL DESCRIPTION	PLASTICITY INDEX (PI)	MOISTURE CONTENT AT TIME OF COMPACTION
NON-PLASTIC SILTY SAND SOILS	PI<15	+/- 3%
SANDY CLAY SOILS	15<PI<25	-1% TO +3%
CLAY SOILS	PI>25	-1% TO +3%

INSTALL FILL FOR EMBANKMENT IN 8" LIFTS, COMPACTED IN HORIZONTAL LIFTS TO A MINIMUM OF 95% OF MAXIMUM DENSITY PER ASTM D-698 STANDARD PROCTOR. MOISTURE CONTENT SHALL BE AS DESCRIBED ABOVE DURING COMPACTION. SELECT FILL SHALL BE ON-SITE CLAYEY SANDY SOILS OR OFF-SITE MATERIAL. MATERIAL SHALL BE FREE OF ORGANIC MATTER OR ROCK FRAGMENTS LARGER THAN 2" IN ANY DIRECTION AND POSSES A PLASTICITY INDEX BETWEEN 10 AND 45, WITH A LIQUID LIMIT OF 70 OR LESS. THE FIRST LIFT OF FILL SHALL BE PLACED WITHIN 48 HOURS OF SATISFACTORY COMPACTION OF THE UNDERLYING SUBGRADE SOILS.

IF DIRECTED BY THE CITY OF LONGVIEW, BLEND THE SUBGRADE SOILS TO A DEPTH OF 12" OVER THE PROJECT AREA TO OBTAIN A UNIFORMLY CONSISTENT PLASTICITY INDEX PRIOR TO LIME OR CEMENT STABILIZATION.

STREETS

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

RESIDENTIAL (COLLECTOR)
STREET 7" CONCRETE
PAVEMENT SECTION

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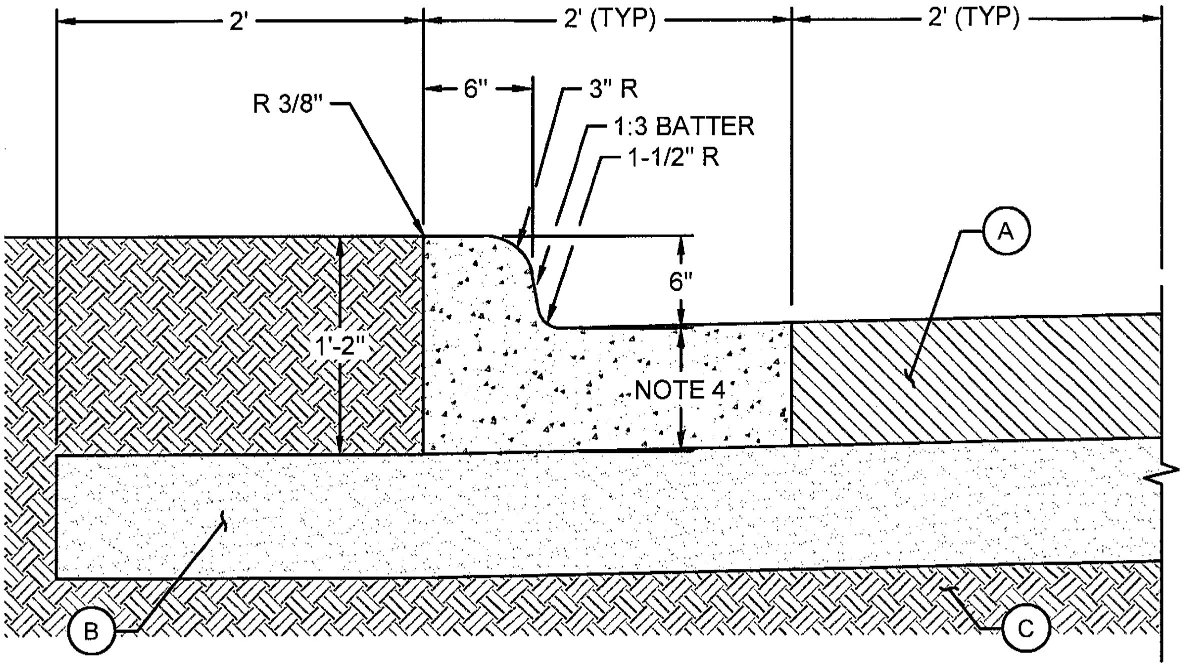

MARK	DESCRIPTION
Ⓐ	PAVEMENT PER CITY OF LONGVIEW STANDARDS.
Ⓑ	LIME OR CEMENT STABILIZED SUBGRADE PER CITY OF LONGVIEW STANDARDS. EXTEND COMPACTED STABILIZED SUBGRADE TO A MINIMUM OF 2 FEET BEYOND THE BACK OF CURB.
Ⓒ	SCARIFY AND COMPACTED SUBGRADE PER CITY OF LONGVIEW STANDARDS. EXTEND A MINIMUM OF 2 FEET BEYOND THE BACK OF CURB.

NOTES:

1. PORTLAND CEMENT CONCRETE SHALL BE TxDOT CLASS P HAVING A MINIMUM COMPRESSIVE STRENGTH OF 4400 PSI AT 28 DAYS (MINIMUM 6 SACKS PER CUBIC YARD).
2. CURB AND GUTTER SHALL HAVE BROOM FINISH.
3. CROSS SLOPE OF GUTTER SHALL MATCH THE CROSS SLOPE OF THE PAVEMENT SECTION UNLESS OTHERWISE DIRECTED BY THE CITY OF LONGVIEW.
4. GUTTER THICKNESS SHALL MATCH THE THE PAVEMENT THICKNESS (6" MINIMUM).
5. FOR AREAS WITH SIDEWALK ADJACENT TO THE CURB AND GUTTER, THE LOCATIONS OF JOINTS IN THE SIDEWALK AND CURB AND GUTTER SHALL MATCH. INSTALL 1/2" EXPANSION JOINT AT BACK OF CURB BETWEEN CURB AND SIDEWALK.

STREETS

LATEST REVISION: 2/28/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

CURB AND GUTTER

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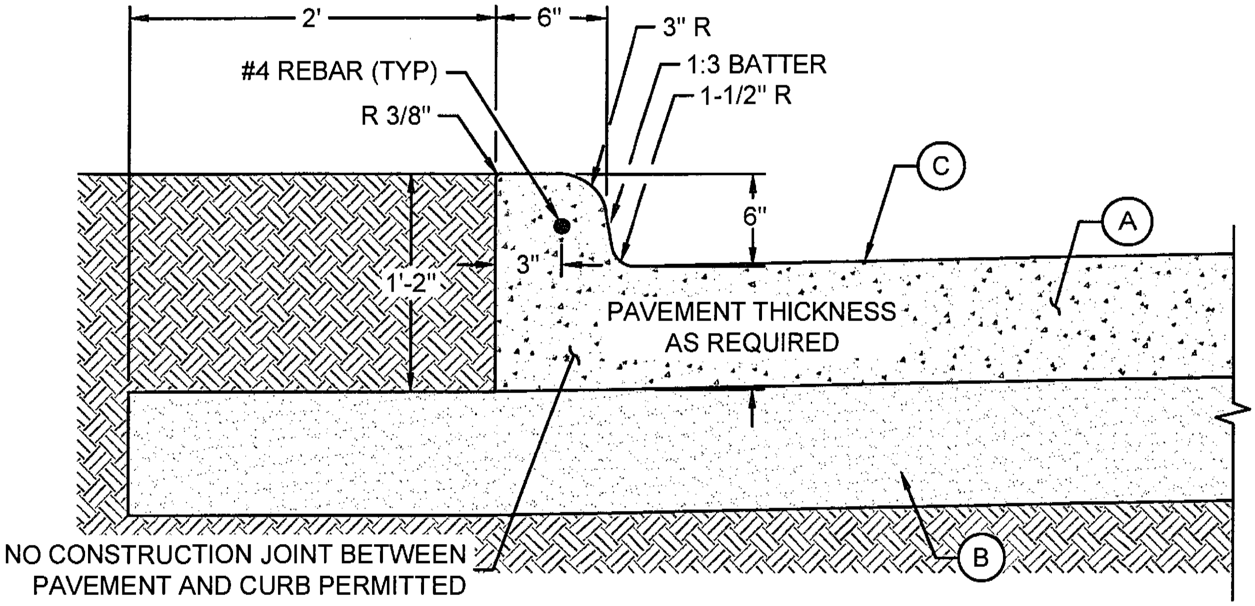

NOTES:

1. PORTLAND CEMENT PAVEMENT SHALL BE TxDOT CLASS P HAVING A MINIMUM 4400 PSI COMPRESSIVE STRENGTH AT 28 DAYS (MINIMUM 6 SACKS PER CUBIC YARD).
2. INSTALL TWO #4 DIA x 18" SMOOTH DOWEL BARS CENTERED IN GUTTER AT CONSTRUCTION JOINTS AND TRANSITIONS.
3. INSTALL TRANSVERSE JOINTS IN CURB AND GUTTER MATCHING PAVEMENT TRANSVERSE JOINT LOCATIONS AND TYPES.
4. CROSS SLOPE OF GUTTER SHALL MATCH CROSS SLOPE OF PAVEMENT.
5. CONSTRUCTION JOINT AND/OR COLD JOINT BETWEEN THE CURB AND PAVEMENT IS NOT PERMITTED.

MARK	DESCRIPTION
Ⓐ	CONCRETE PAVEMENT PER CITY OF LONGVIEW STANDARD (MINIMUM 6" THICK FOR RESIDENTIAL LOCAL AND MINIMUM 7" THICK FOR RESIDENTIAL COLLECTOR).
Ⓑ	LINE OR CEMENT STABILIZED SUBGRADE PER CITY OF LONGVIEW STANDARD. EXTEND STABILIZATION A MINIMUM OF 2' BEYOND THE BACK OF CURB.
Ⓒ	PROVIDE SCORE OR OTHER APPROVED DELINEATION LINE 24" FROM AND PARALLEL TO BACK OF CURB TO CREATE STANDARD 24" CURB AND GUTTER APPEARANCE. FINISH CURB AND GUTTER WITH BROOM FINISH MATCHING STANDARD 24" CURB AND GUTTER TO SET APART FROM PAVEMENT FINISH.

STREETS
LATEST REVISION:
3/16/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

MONOLITHIC CURB
AND GUTTER

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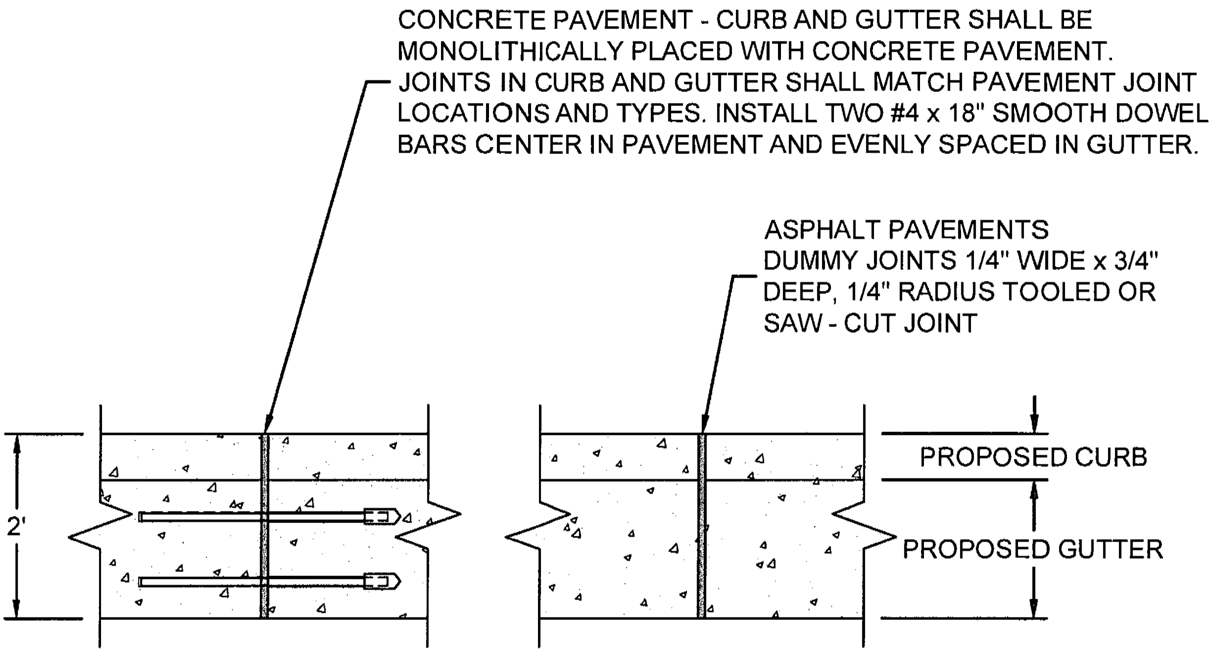

CONCRETE PAVEMENT - CURB AND GUTTER SHALL BE MONOLITHICALLY PLACED WITH CONCRETE PAVEMENT. JOINTS IN CURB AND GUTTER SHALL MATCH PAVEMENT JOINT LOCATIONS AND TYPES. INSTALL TWO #4 x 18" SMOOTH DOWEL BARS CENTER IN PAVEMENT AND EVENLY SPACED IN GUTTER.

ASPHALT PAVEMENTS DUMMY JOINTS 1/4" WIDE x 3/4" DEEP, 1/4" RADIUS TOOLED OR SAW - CUT JOINT

CURB AND GUTTER JOINT DETAIL (PLAN VIEW)

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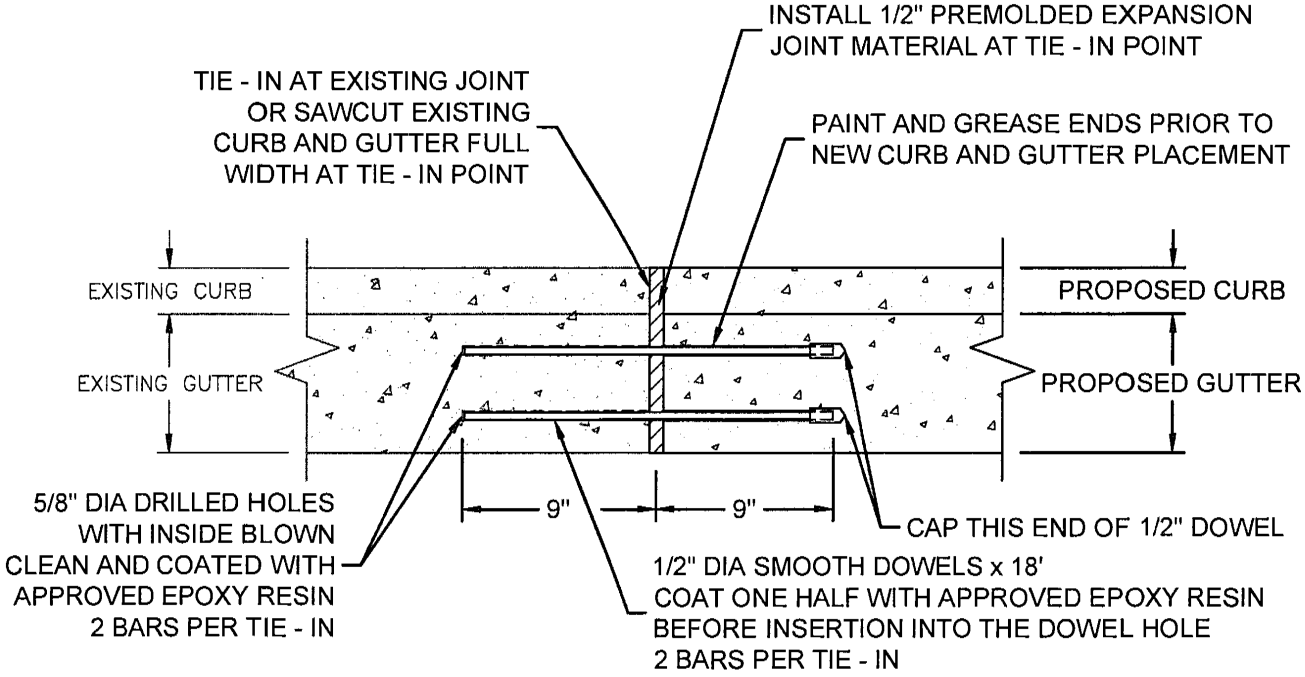

INSTALL 1/2" PREMOLDED EXPANSION JOINT MATERIAL AT TIE - IN POINT

TIE - IN AT EXISTING JOINT OR SAWCUT EXISTING CURB AND GUTTER FULL WIDTH AT TIE - IN POINT

PAINT AND GREASE ENDS PRIOR TO NEW CURB AND GUTTER PLACEMENT

5/8" DIA DRILLED HOLES WITH INSIDE BLOWN CLEAN AND COATED WITH APPROVED EPOXY RESIN 2 BARS PER TIE - IN

CAP THIS END OF 1/2" DOWEL

1/2" DIA SMOOTH DOWELS x 18' COAT ONE HALF WITH APPROVED EPOXY RESIN BEFORE INSERTION INTO THE DOWEL HOLE 2 BARS PER TIE - IN

EXPANSION JOINT (PLAN VIEW)

NTS

STREETS

LATEST REVISION: 3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

CURB AND GUTTER
JOINTS

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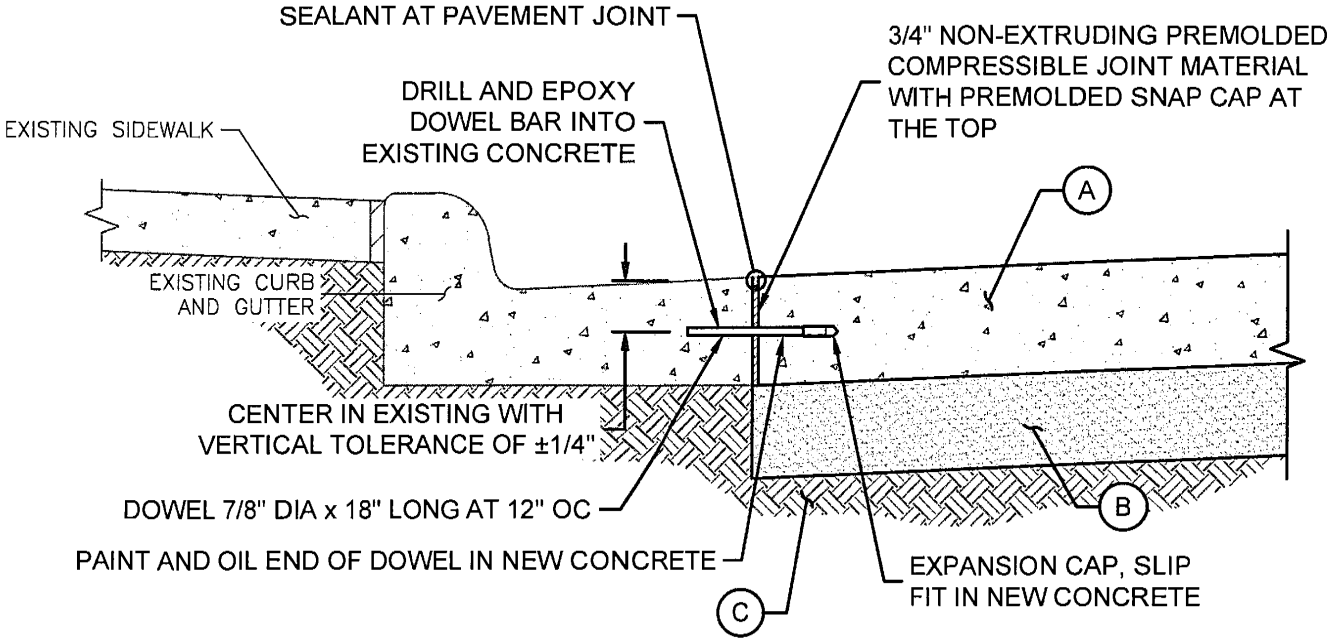
SEALANT AT PAVEMENT JOINT
3/4" NON-EXTRUDING PREMOLDED COMPRESSIBLE JOINT MATERIAL WITH PREMOLDED SNAP CAP AT THE TOP
DRILL AND EPOXY DOWEL BAR INTO EXISTING CONCRETE
EXISTING SIDEWALK
A
EXISTING CURB AND GUTTER
CENTER IN EXISTING WITH VERTICAL TOLERANCE OF ±1/4"
DOWEL 7/8" DIA x 18" LONG AT 12" OC
PAINT AND OIL END OF DOWEL IN NEW CONCRETE
B
EXPANSION CAP, SLIP FIT IN NEW CONCRETE
C

MARK	DESCRIPTION
Ⓐ	CONCRETE PAVEMENT PER CITY OF LONGVIEW STANDARDS.
Ⓑ	LINE OR CEMENT TREATED, COMPACTED SUBGRADE PER CITY OF LONGVIEW STANDARDS.
Ⓒ	SCARIFY AND COMPACT PER CITY OF LONGVIEW STANDARDS.

NOTES:

1. ALL TIE - INS SHALL BE DONE WITH EXPANSION JOINTS AS DETAILED HERE UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
2. DETAIL IS TYPICAL FOR TIE - IN OF NEW CONCRETE PAVEMENT TO EXISTING CURB AND GUTTER.
3. NEW CURB AND GUTTER TIE - IN TO EXISTING PAVEMENT - SIMILAR CONSTRUCTION IS REQUIRED FOR TIE - IN OF NEW CURB AND GUTTER TO EXISTING PAVEMENT WITH DOWEL BARS FIXED IN PAVEMENT AND GREASED BAR WITH CAP IN CURB AND GUTTER.
4. EXPANSION JOINTS SHALL BE CONTINUOUS AND SHALL EXTEND ON ALL SIDES OF BLOCKOUTS AND TIE - INS.
5. PREMOLDED JOINT MATERIAL SHALL HAVE SNAP CAP AT THE TOP. CUTTING OR SHREDDING THE JOINT MATERIAL IS NOT PERMITTED. SEAL JOINTS AS REQUIRED BY THE CITY OF LONGVIEW.

STREETS
LATEST REVISION: 3/17/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

CURB AND GUTTER
PAVEMENT TIE - IN

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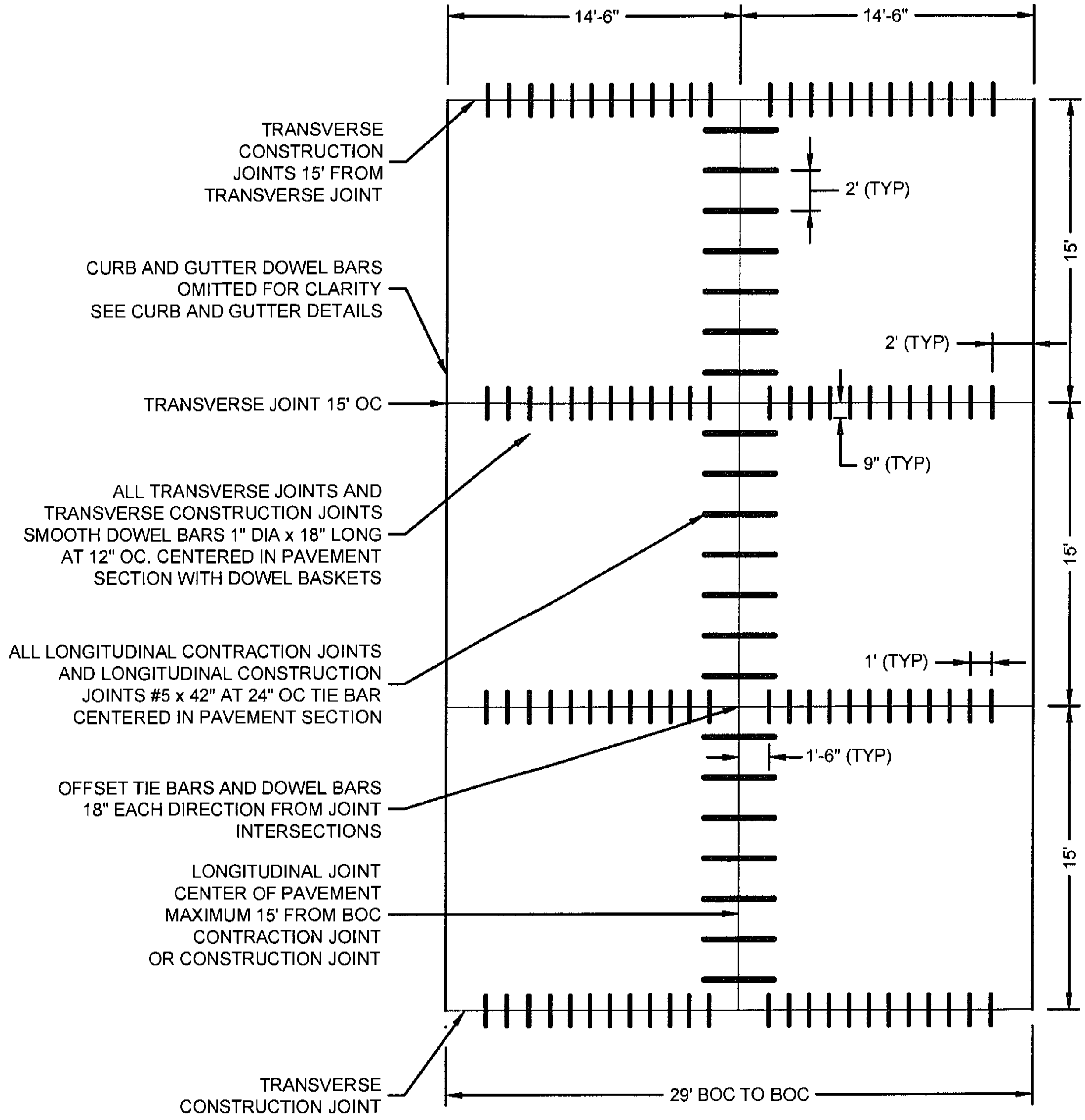
14'-6"
14'-6"
TRANSVERSE CONSTRUCTION JOINTS 15' FROM TRANSVERSE JOINT
2' (TYP)
CURB AND GUTTER DOWEL BARS OMITTED FOR CLARITY SEE CURB AND GUTTER DETAILS
15'
2' (TYP)
TRANSVERSE JOINT 15' OC
9" (TYP)
ALL TRANSVERSE JOINTS AND TRANSVERSE CONSTRUCTION JOINTS SMOOTH DOWEL BARS 1" DIA x 18" LONG AT 12" OC. CENTERED IN PAVEMENT SECTION WITH DOWEL BASKETS
15'
ALL LONGITUDINAL CONTRACTION JOINTS AND LONGITUDINAL CONSTRUCTION JOINTS #5 x 42" AT 24" OC TIE BAR CENTERED IN PAVEMENT SECTION
1' (TYP)
1'-6" (TYP)
OFFSET TIE BARS AND DOWEL BARS 18" EACH DIRECTION FROM JOINT INTERSECTIONS
15'
LONGITUDINAL JOINT CENTER OF PAVEMENT MAXIMUM 15' FROM BOC CONTRACTION JOINT OR CONSTRUCTION JOINT
TRANSVERSE CONSTRUCTION JOINT
29' BOC TO BOC

NOTES:

1. SEE ADDITIONAL DETAILS FOR JOINT CONSTRUCTION. DETAILS FOR PAVEMENT THICKNESS, CURB AND GUTTER, AND CURB AND GUTTER DOWEL BARS ARE SHOWN ELSEWHERE. REFER TO STANDARD DETAILS.
2. TRANSVERSE JOINTS SHALL BE SPACED ON 15 FEET CENTER UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
3. TRANSVERSE CONSTRUCTION JOINTS SHALL BE LOCATED AT A THE LOCATION OF A TYPICAL TRANSVERSE JOINT. INTERMEDIATE TRANSVERSE CONSTRUCTION JOINTS ARE NOT PERMITTED.
4. LAYOUT DOWEL BARS STARTING AT LONGITUDINAL JOINTS. OFFSET 1ST DOWEL BARS 18" EACH SIDE OF LONGITUDINAL JOINTS. SPACE DOWEL BARS 12" OC. PLACEMENT OF TRANSVERSE DOWEL BARS SHALL TERMINATE 2'-0" FROM BOC EACH SIDE OF PAVEMENT.
5. CURB AND GUTTER DOWEL BARS OMITTED FOR CLARITY. INSTALL TWO #4 DOWELS EVENLY SPACED AT THE GUTTER AT ALL TRANSVERSE JOINTS AND TRANSVERSE CONTRACTION JOINTS. SEE CURB AND GUTTER DETAILS.

	STREETS LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	RESIDENTIAL LOCAL STREET JOINT LAYOUT

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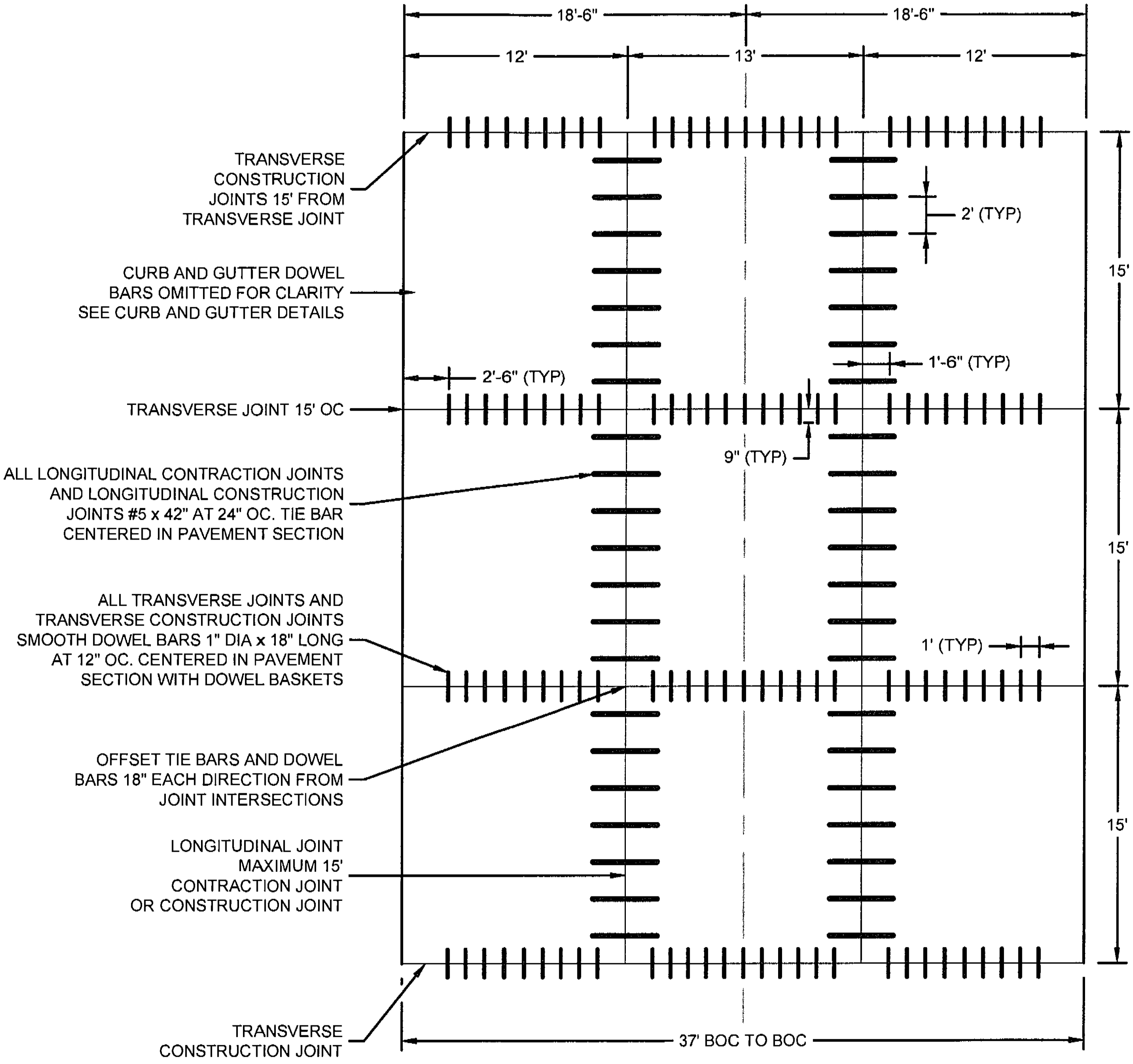

18'-6"
18'-6"
12'
13'
12'
TRANSVERSE CONSTRUCTION JOINTS 15' FROM TRANSVERSE JOINT
CURB AND GUTTER DOWEL BARS OMITTED FOR CLARITY SEE CURB AND GUTTER DETAILS
2' (TYP)
15'
2'-6" (TYP)
1'-6" (TYP)
TRANSVERSE JOINT 15' OC
9" (TYP)
ALL LONGITUDINAL CONTRACTION JOINTS AND LONGITUDINAL CONSTRUCTION JOINTS #5 x 42" AT 24" OC. TIE BAR CENTERED IN PAVEMENT SECTION
15'
ALL TRANSVERSE JOINTS AND TRANSVERSE CONSTRUCTION JOINTS SMOOTH DOWEL BARS 1" DIA x 18" LONG AT 12" OC. CENTERED IN PAVEMENT SECTION WITH DOWEL BASKETS
1' (TYP)
OFFSET TIE BARS AND DOWEL BARS 18" EACH DIRECTION FROM JOINT INTERSECTIONS
15'
LONGITUDINAL JOINT MAXIMUM 15' CONTRACTION JOINT OR CONSTRUCTION JOINT
TRANSVERSE CONSTRUCTION JOINT
37' BOC TO BOC

NOTES:

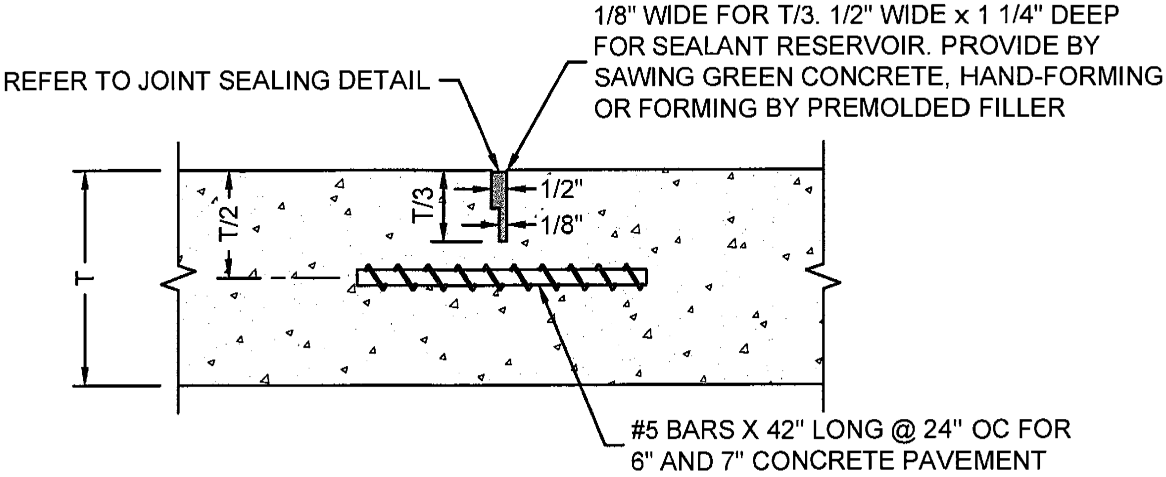
1. SEE ADDITIONAL DETAILS FOR JOINT CONSTRUCTION. DETAILS FOR PAVEMENT THICKNESS, CURB AND GUTTER, AND CURB AND GUTTER DOWEL BARS ARE SHOWN ELSEWHERE. REFER TO STANDARD DETAILS.
2. TRANSVERSE JOINTS SHALL BE SPACED ON 15 FEET CENTER UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
3. TRANSVERSE CONSTRUCTION JOINTS SHALL BE LOCATED AT THE LOCATION OF A TYPICAL TRANSVERSE JOINT. INTERMEDIATE TRANSVERSE CONSTRUCTION JOINTS ARE NOT PERMITTED.
4. LAYOUT DOWEL BARS STARTING AT LONGITUDINAL JOINTS. OFFSET 1ST DOWEL BARS 18" EACH SIDE OF LONGITUDINAL JOINTS. SPACE DOWEL BARS 12" OC. PLACEMENT OF TRANSVERSE DOWEL BARS SHALL TERMINATE 2'-6" FROM BOC EACH SIDE OF PAVEMENT.
5. CURB AND GUTTER DOWEL BARS OMITTED FOR CLARITY. INSTALL TWO #4 DOWELS EVENLY SPACED AT THE GUTTER AT ALL TRANSVERSE JOINTS AND TRANSVERSE CONTRACTION JOINTS. SEE CURB AND GUTTER DETAILS.

STREETS

LATEST REVISION:
3/21/2018

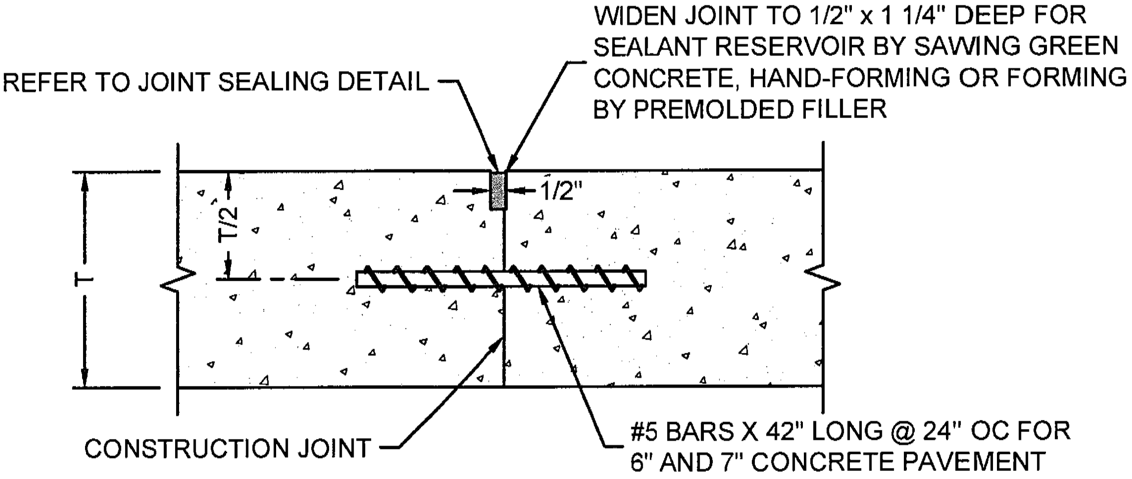
CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

RESIDENTIAL COLLECTOR
STREET JOINT LAYOUT


1/8" WIDE FOR T/3. 1/2" WIDE x 1 1/4" DEEP FOR SEALANT RESERVOIR. PROVIDE BY SAWING GREEN CONCRETE, HAND-FORMING OR FORMING BY PREMOLDED FILLER
REFER TO JOINT SEALING DETAIL
T
T/2
T/3
1/2"
1/8"
#5 BARS X 42" LONG @ 24" OC FOR 6" AND 7" CONCRETE PAVEMENT

LONGITUDINAL CONTRACTION JOINT

NTS


WIDEN JOINT TO 1/2" x 1 1/4" DEEP FOR SEALANT RESERVOIR BY SAWING GREEN CONCRETE, HAND-FORMING OR FORMING BY PREMOLDED FILLER
REFER TO JOINT SEALING DETAIL
T
T/2
1/2"
CONSTRUCTION JOINT
#5 BARS X 42" LONG @ 24" OC FOR 6" AND 7" CONCRETE PAVEMENT

LONGITUDINAL CONSTRUCTION JOINT

NTS

NOTES:

1. CONCRETE PAVEMENT THICKNESS SHALL BE A MINIMUM OF 6" FOR RESIDENTIAL LOCAL STREETS AND A MINIMUM OF 7" FOR RESIDENTIAL COLLECTOR STREETS.
2. LONGITUDINAL JOINTS SHALL BE STRAIGHT WITH NO MORE THAN 1" VARIATION IN 20 FEET.
3. LONGITUDINAL JOINTS SHALL BE SPACED A MAXIMUM OF 15 FEET APART OR 15 FEET FROM BOC.
4. TIE BARS SHALL BE GRADE 60 DEFORMED BARS WITH A MAXIMUM SPACING OF 24" OC AND SHALL BE OFFSET 18" FROM TRANSVERSE JOINT IN INTERSECTIONS.
5. JOINT SEALANT RESERVOIR SHALL BE A MINIMUM OF 1/3 THE PAVEMENT THICKNESS AND 3/4" WIDE (±1/8"). SAWCUT JOINTS SHALL BE COMPLETED WITHIN 24 HOURS OF CONCRETE PLACEMENT.
6. TIE BARS AT CONSTRUCTION JOINTS MAY BE TWO PIECE BARS WITH CITY OF LONGVIEW APPROVAL.
7. BENT BARS SHALL BE STRAIGHTENED. BROKEN OR MISSING BARS SHALL BE REPLACED WITH NEW BARS. DRILL AND EPOXY REPLACEMENT BARS IN PLACE AS DIRECTED BY THE CITY OF LONGVIEW.

	STREETS	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	LONGITUDINAL JOINTS
	LATEST REVISION: 3/21/2018		

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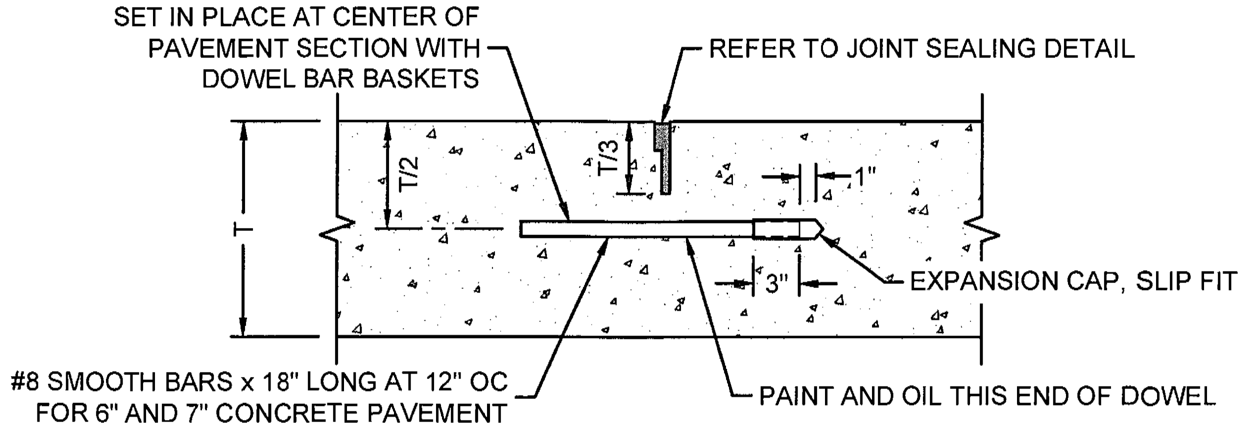
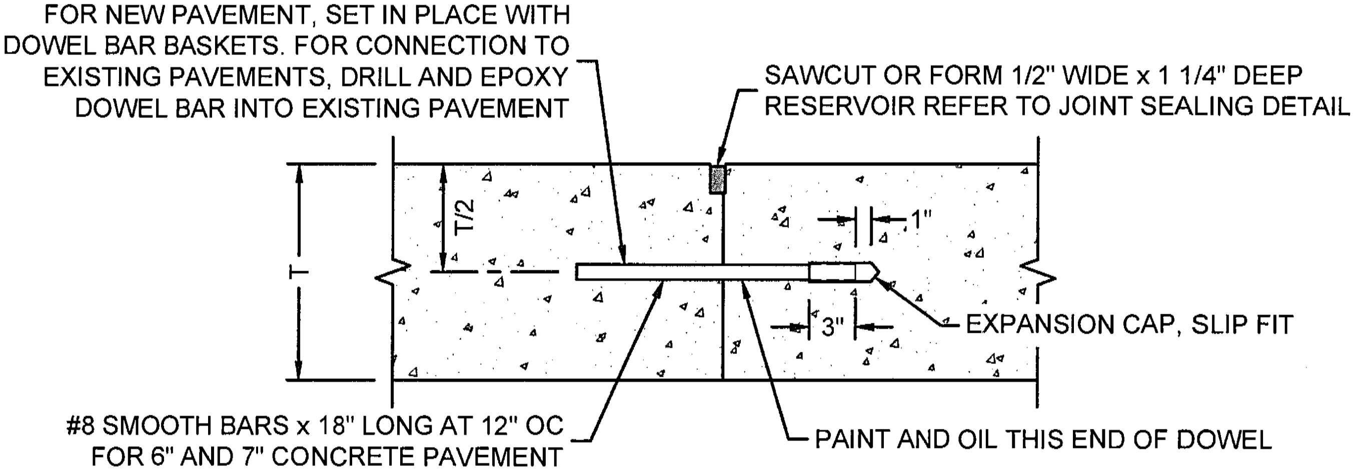

SET IN PLACE AT CENTER OF PAVEMENT SECTION WITH DOWEL BAR BASKETS
REFER TO JOINT SEALING DETAIL
T
T/2
T/3
1"
3"
EXPANSION CAP, SLIP FIT
#8 SMOOTH BARS x 18" LONG AT 12" OC FOR 6" AND 7" CONCRETE PAVEMENT
PAINT AND OIL THIS END OF DOWEL

TRANSVERSE JOINT

NTS


FOR NEW PAVEMENT, SET IN PLACE WITH DOWEL BAR BASKETS. FOR CONNECTION TO EXISTING PAVEMENTS, DRILL AND EPOXY DOWEL BAR INTO EXISTING PAVEMENT
SAWCUT OR FORM 1/2" WIDE x 1 1/4" DEEP RESERVOIR REFER TO JOINT SEALING DETAIL
T
T/2
1"
3"
EXPANSION CAP, SLIP FIT
#8 SMOOTH BARS x 18" LONG AT 12" OC FOR 6" AND 7" CONCRETE PAVEMENT
PAINT AND OIL THIS END OF DOWEL

TRANSVERSE CONSTRUCTION JOINT

NTS

NOTES:

1. CONCRETE PAVEMENT THICKNESS SHALL BE A MINIMUM OF 6" FOR RESIDENTIAL LOCAL STREETS AND A MINIMUM OF 7" FOR RESIDENTIAL COLLECTOR STREETS.
2. TRANSVERSE JOINTS SHALL BE STRAIGHT WITH NO MORE THAN 1" VARIATION IN 20 FEET.
3. TRANSVERSE JOINTS SHALL BE SPACED NO MORE THAN 15 FEET OC.
4. DOWEL BARS SHALL BE SPACED AT 12" OC AND SHALL BE OFFSET 18" FROM LONGITUDINAL JOINT INTERSECTIONS.
5. JOINT SEALANT RESERVOIR SHALL BE A MINIMUM OF 1/3 THE PAVEMENT THICKNESS AND 3/4" WIDE (±1/8"). SAWCUT JOINTS SHALL BE COMPLETED WITHIN 24 HOURS OF CONCRETE PLACEMENT.
6. BENT, BROKEN, OR MISSING BARS SHALL BE REPLACED WITH NEW BARS. DRILL AND EPOXY REPLACEMENT BARS IN PLACE AS DIRECTED BY THE CITY OF LONGVIEW.
7. DOWEL BAR PLACEMENT TOLERANCE SHALL BE ±1/4" HORIZONTALLY AND VERTICALLY. REMOVE SHIPPING WIRES FROM DOWEL BAR BASKETS PRIOR TO CEMENT PLACEMENT.

	STREETS	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	TRANSVERSE JOINTS
	LATEST REVISION: 3/21/2018		

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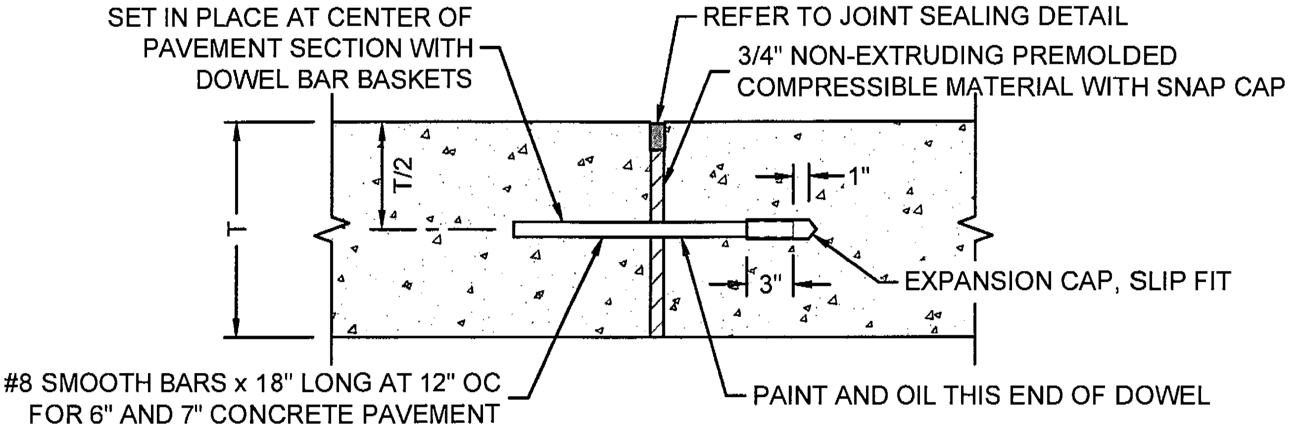
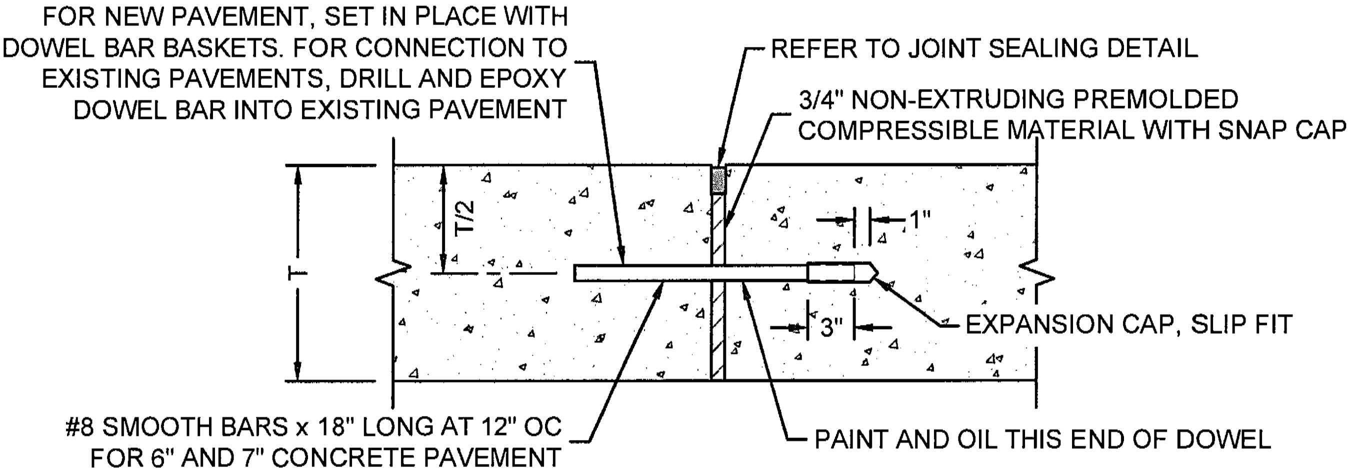

SET IN PLACE AT CENTER OF PAVEMENT SECTION WITH DOWEL BAR BASKETS
REFER TO JOINT SEALING DETAIL
3/4" NON-EXTRUDING PREMOLDED COMPRESSIBLE MATERIAL WITH SNAP CAP
T/2
T
1"
3"
EXPANSION CAP, SLIP FIT
#8 SMOOTH BARS x 18" LONG AT 12" OC FOR 6" AND 7" CONCRETE PAVEMENT
PAINT AND OIL THIS END OF DOWEL

TRANSVERSE EXPANSION JOINT

NTS


FOR NEW PAVEMENT, SET IN PLACE WITH DOWEL BAR BASKETS. FOR CONNECTION TO EXISTING PAVEMENTS, DRILL AND EPOXY DOWEL BAR INTO EXISTING PAVEMENT
REFER TO JOINT SEALING DETAIL
3/4" NON-EXTRUDING PREMOLDED COMPRESSIBLE MATERIAL WITH SNAP CAP
T/2
T
1"
3"
EXPANSION CAP, SLIP FIT
#8 SMOOTH BARS x 18" LONG AT 12" OC FOR 6" AND 7" CONCRETE PAVEMENT
PAINT AND OIL THIS END OF DOWEL

TRANSVERSE EXPANSION - CONSTRUCTION JOINT

NTS

NOTES:

1. PROVIDE EXPANSION JOINTS AT INTERSECTING PAVEMENTS. ADDITIONAL EXPANSION JOINTS SHALL BE LOCATED AS DIRECTED BY THE CITY OF LONGVIEW.
2. CONCRETE PAVEMENT THICKNESS SHALL BE A MINIMUM OF 6" FOR RESIDENTIAL LOCAL STREETS AND A MINIMUM OF 7" FOR RESIDENTIAL COLLECTOR STREETS.
3. TRANSVERSE JOINTS SHALL BE STRAIGHT WITH NO MORE THAN 1" VARIATION IN 20 FEET.
4. JOINTS SHALL BE SPACED NO MORE THAN 15 FEET OC. DOWEL BARS SHALL BE SPACED AT 12" OC AND SHALL BE OFFSET 18" FROM LONGITUDINAL JOINT INTERSECTIONS.
5. BENT, BROKEN, OR MISSING BARS SHALL BE REPLACED WITH NEW BARS. DRILL AND EPOXY BARS IN PLACE AS DIRECTED BY THE CITY OF LONGVIEW.
6. DOWEL PLACEMENT TOLERANCE SHALL BE ±1/4" HORIZONTALLY AND VERTICALLY. REMOVE SHIPPING WIRES FROM DOWEL BAR BASKETS PRIOR TO CEMENT PLACEMENT.

	STREETS LATEST REVISION: 3/21/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	TRANSVERSE EXPANSION JOINTS

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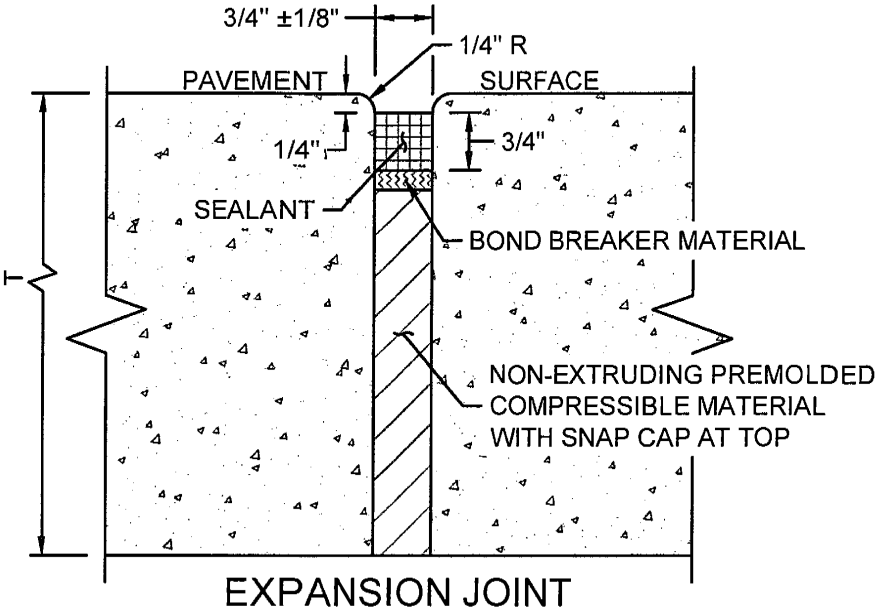
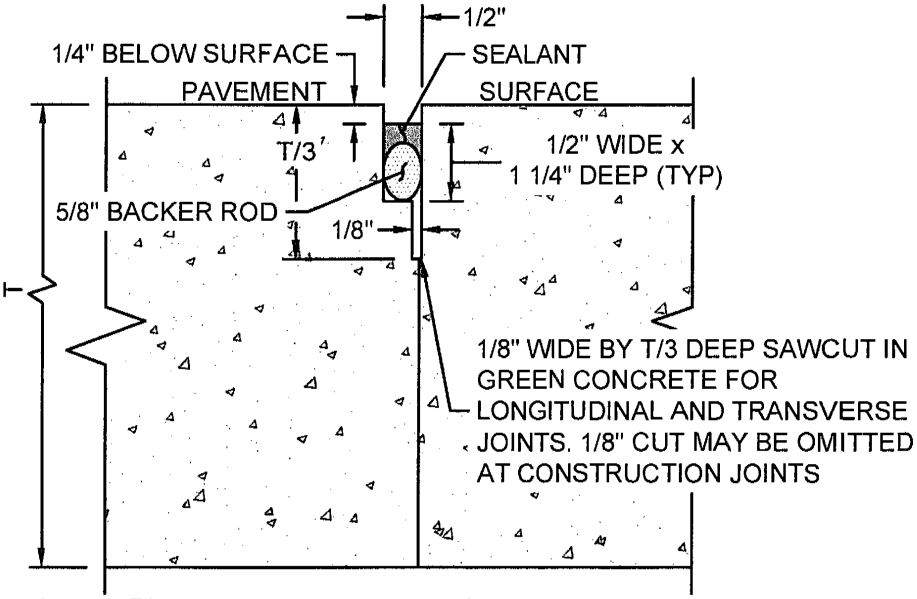

3/4" ±1/8"
1/4" R
PAVEMENT
SURFACE
1/4"
3/4"
SEALANT
BOND BREAKER MATERIAL
T
NON-EXTRUDING PREMOLDED COMPRESSIBLE MATERIAL WITH SNAP CAP AT TOP

EXPANSION JOINT

NTS


1/2"
1/4" BELOW SURFACE
SEALANT
PAVEMENT
SURFACE
T/3
1/2" WIDE x 1 1/4" DEEP (TYP)
5/8" BACKER ROD
1/8"
T
1/8" WIDE BY T/3 DEEP SAWCUT IN GREEN CONCRETE FOR LONGITUDINAL AND TRANSVERSE JOINTS. 1/8" CUT MAY BE OMITTED AT CONSTRUCTION JOINTS

SEALANT RESERVOIR CONTRACTION JOINT, TRANSVERSE JOINT, CONSTRUCTION JOINT

NTS

NOTE:

LONGITUDINAL AND TRANSVERSE JOINTS SHALL BE A MINIMUM OF 1/8" WIDE FOR 1/3 OF THE PAVEMENT THICKNESS.

	STREETS	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	JOINT SEALING
	LATEST REVISION: 3/21/2018		

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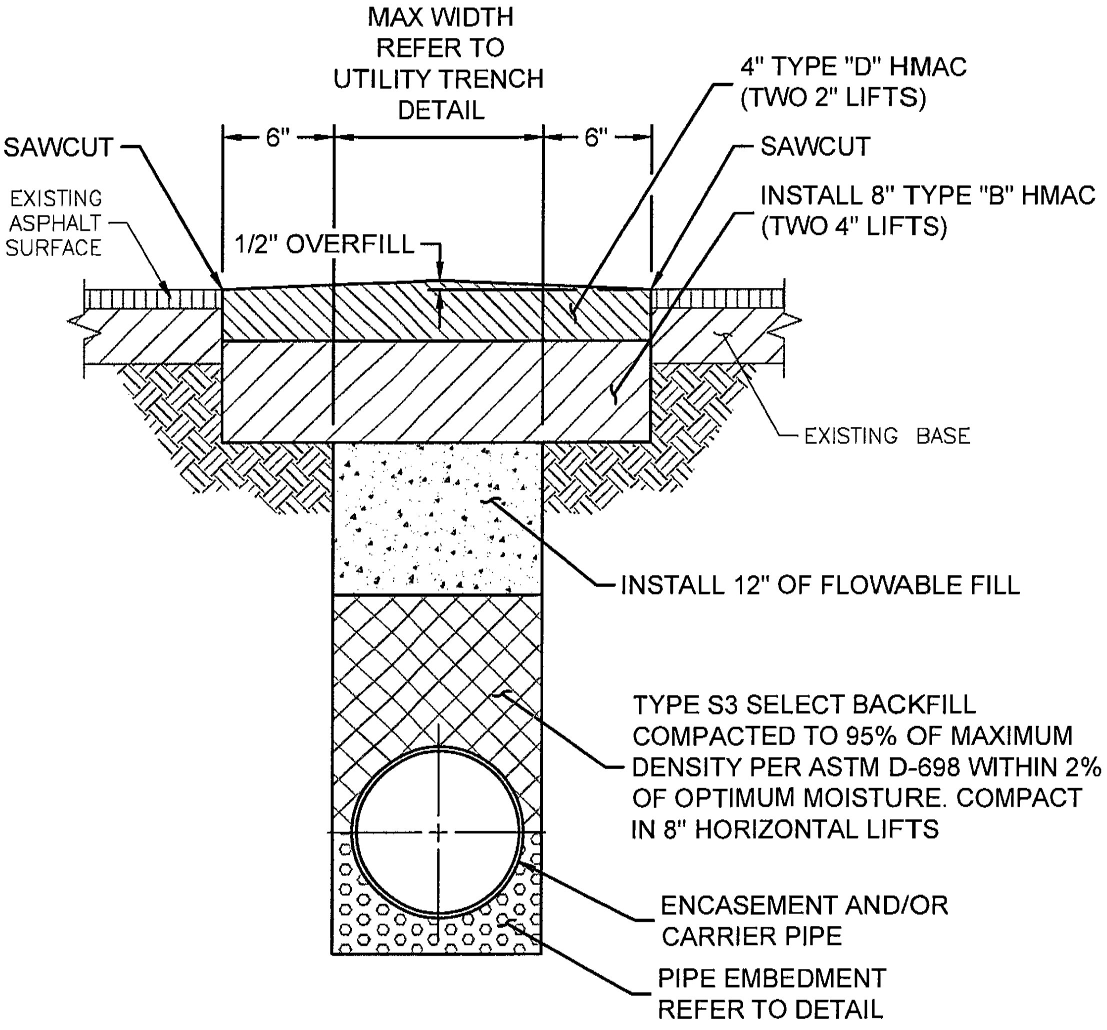
MAX WIDTH REFER TO UTILITY TRENCH DETAIL
6"
6"
SAWCUT
4" TYPE "D" HMAC (TWO 2" LIFTS)
SAWCUT
EXISTING ASPHALT SURFACE
INSTALL 8" TYPE "B" HMAC (TWO 4" LIFTS)
1/2" OVERFILL
EXISTING BASE
INSTALL 12" OF FLOWABLE FILL
TYPE S3 SELECT BACKFILL COMPACTED TO 95% OF MAXIMUM DENSITY PER ASTM D-698 WITHIN 2% OF OPTIMUM MOISTURE. COMPACT IN 8" HORIZONTAL LIFTS
ENCASEMENT AND/OR CARRIER PIPE
PIPE EMBEDMENT REFER TO DETAIL

NOTE:

PROVIDE CRS-2H TACK COAT AT A RATE OF 0.10 GALLON PER SQUARE YARD BETWEEN EACH ASPHALT LIFT.

	STREETS	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SAWCUT AND REPAIR ASPHALT ROAD PAVEMENT
	LATEST REVISION: 3/20/2018		

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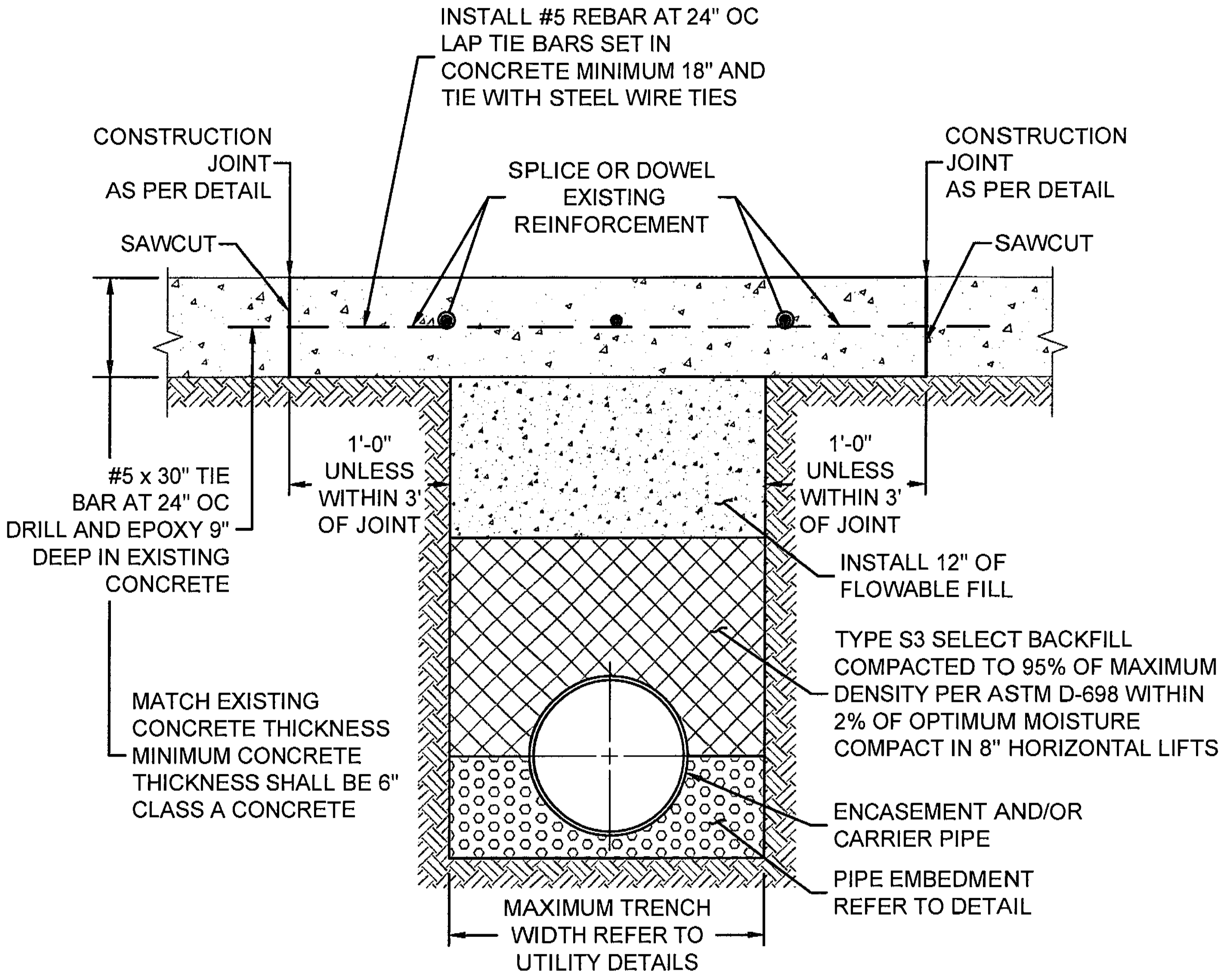
INSTALL #5 REBAR AT 24" OC
LAP TIE BARS SET IN
CONCRETE MINIMUM 18" AND
TIE WITH STEEL WIRE TIES
CONSTRUCTION
JOINT
AS PER DETAIL
SPLICE OR DOWEL
EXISTING
REINFORCEMENT
CONSTRUCTION
JOINT
AS PER DETAIL
SAWCUT
SAWCUT
1'-0"
UNLESS
WITHIN 3'
OF JOINT
1'-0"
UNLESS
WITHIN 3'
OF JOINT
#5 x 30" TIE
BAR AT 24" OC
DRILL AND EPOXY 9"
DEEP IN EXISTING
CONCRETE
INSTALL 12" OF
FLOWABLE FILL
TYPE S3 SELECT BACKFILL
COMPACTED TO 95% OF MAXIMUM
DENSITY PER ASTM D-698 WITHIN
2% OF OPTIMUM MOISTURE
COMPACT IN 8" HORIZONTAL LIFTS
MATCH EXISTING
CONCRETE THICKNESS
MINIMUM CONCRETE
THICKNESS SHALL BE 6"
CLASS A CONCRETE
ENCASEMENT AND/OR
CARRIER PIPE
PIPE EMBEDMENT
REFER TO DETAIL
MAXIMUM TRENCH
WIDTH REFER TO
UTILITY DETAILS

NOTE:

CONTRACTOR SHALL MATCH EXISTING FINISH, GRADE, AND JOINTS.

	STREETS LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	SAWCUT AND REPAIR CONCRETE PAVEMENT

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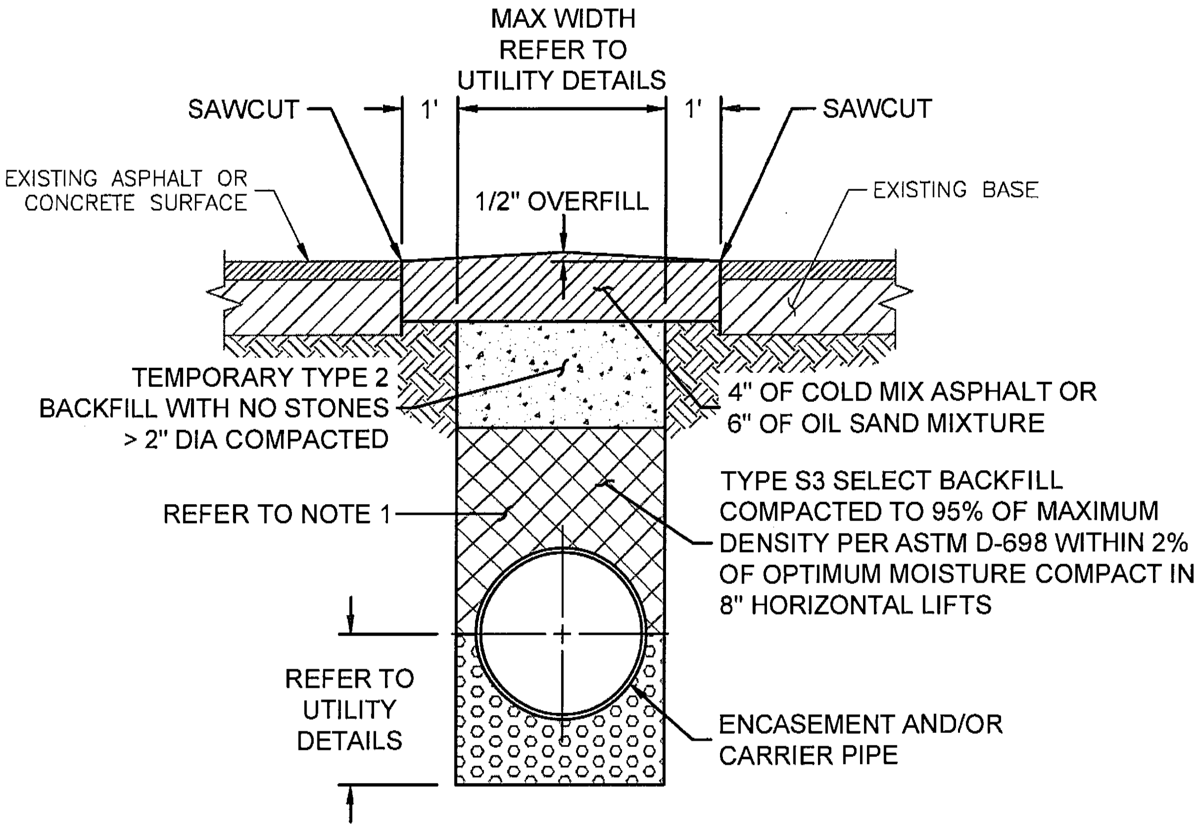

MAX WIDTH
REFER TO
UTILITY DETAILS
SAWCUT
1'
1'
SAWCUT
EXISTING ASPHALT OR
CONCRETE SURFACE
1/2" OVERFILL
EXISTING BASE
TEMPORARY TYPE 2
BACKFILL WITH NO STONES
> 2" DIA COMPACTED
4" OF COLD MIX ASPHALT OR
6" OF OIL SAND MIXTURE
TYPE S3 SELECT BACKFILL
COMPACTED TO 95% OF MAXIMUM
DENSITY PER ASTM D-698 WITHIN 2%
OF OPTIMUM MOISTURE COMPACT IN
8" HORIZONTAL LIFTS
REFER TO NOTE 1
REFER TO
UTILITY
DETAILS
ENCASEMENT AND/OR
CARRIER PIPE

NOTE:

1. CONCRETE PAVEMENT: EXTEND COMPACTED S3 BACKFILL TO WITHIN 12" OF THE BASE OF THE CONCRETE PAVEMENT. ASPHALT PAVEMENT: EXTEND COMPACTED S3 BACKFILL TO WITHIN 12" OF THE TOP OF THE ASPHALT PAVEMENT.

2. TO BE USED FOR TEMPORARY STREET OR DRIVEWAY REPAIR FOR EXISTING STREETS OR DRIVEWAY WITHIN CONSTRUCTION LIMITS UNTIL FINAL ROADWAY SECTION IS COMPLETED.

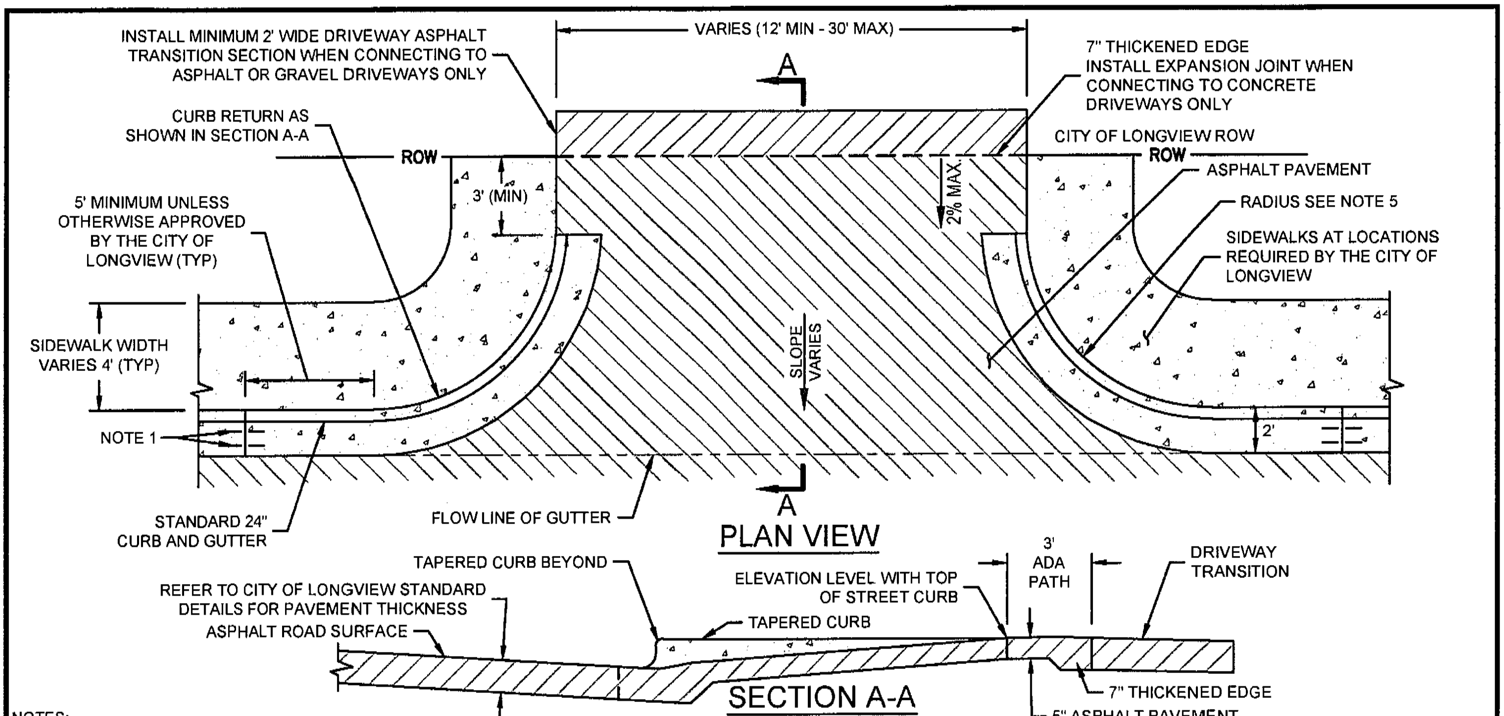
STREETS

LATEST REVISION: 3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

TEMPORARY PAVEMENT
REPAIR

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - ST - PVMT - TEMP - REPAIR.dwg


INSTALL MINIMUM 2' WIDE DRIVEWAY ASPHALT TRANSITION SECTION WHEN CONNECTING TO ASPHALT OR GRAVEL DRIVEWAYS ONLY
VARIES (12' MIN - 30' MAX)
A
7" THICKENED EDGE INSTALL EXPANSION JOINT WHEN CONNECTING TO CONCRETE DRIVEWAYS ONLY
CURB RETURN AS SHOWN IN SECTION A-A
CITY OF LONGVIEW ROW
ROW
ROW
ASPHALT PAVEMENT
3' (MIN)
2% MAX.
RADIUS SEE NOTE 5
5' MINIMUM UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW (TYP)
SIDEWALKS AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
SIDEWALK WIDTH VARIES 4' (TYP)
SLOPE VARIES
NOTE 1
2'
STANDARD 24" CURB AND GUTTER
FLOW LINE OF GUTTER
A
PLAN VIEW
3' ADA PATH
DRIVEWAY TRANSITION
TAPERED CURB BEYOND
ELEVATION LEVEL WITH TOP OF STREET CURB
REFER TO CITY OF LONGVIEW STANDARD DETAILS FOR PAVEMENT THICKNESS
TAPERED CURB
ASPHALT ROAD SURFACE
SECTION A-A
7" THICKENED EDGE
5" ASPHALT PAVEMENT

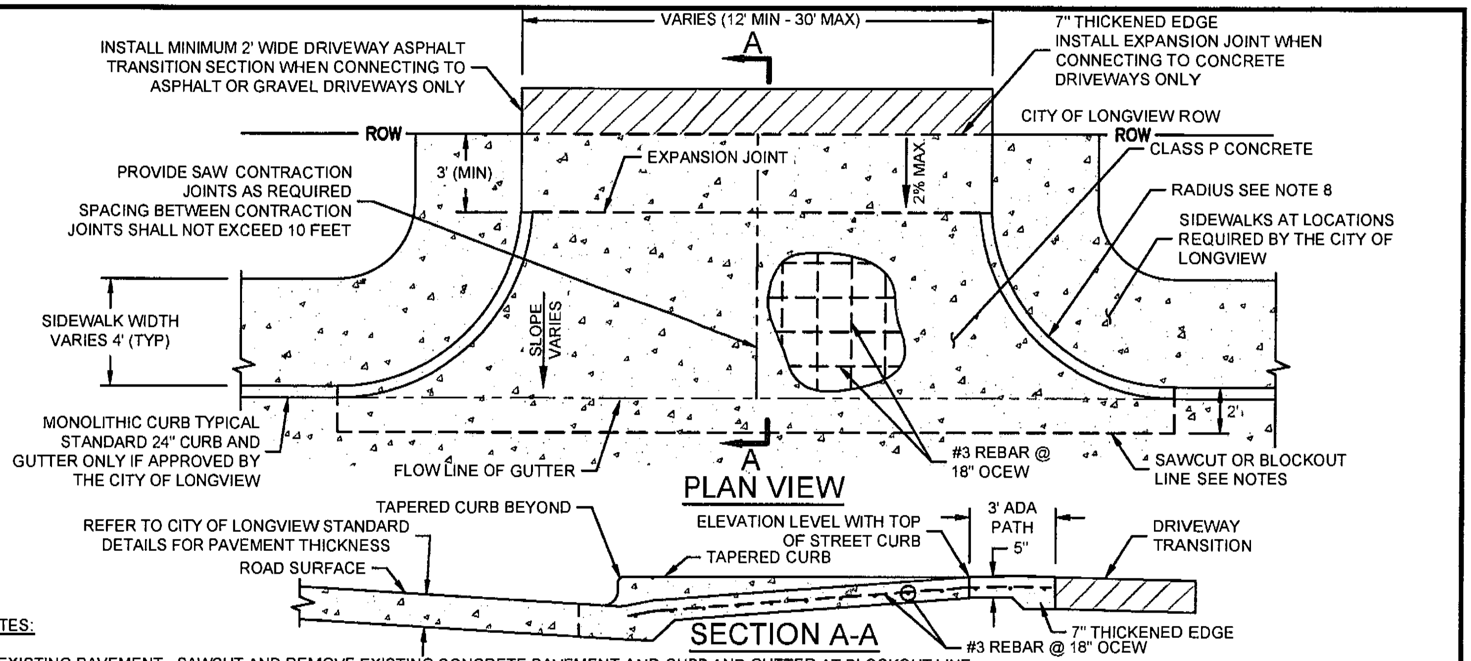
NOTES:

1. WHEN CONNECTING TO EXISTING CURB AND GUTTER: SAWCUT AND REMOVE EXISTING CURB AND GUTTER TO THE LIMITS REQUIRED BY THE CITY OF LONGVIEW. CONSTRUCT CURB AND GUTTER EXPANSION JOINTS PER CITY OF LONGVIEW STANDARD AT EACH CURB AND GUTTER TIE - IN.
2. FOR NEW CURB AND GUTTER AT NEW DRIVEWAY, INSTALL EXPANSION JOINT IN CURB AND GUTTER AT 5 FEET FROM END OF EACH DRIVEWAY CURB RETURN OR AS APPROVED BY THE CITY OF LONGVIEW.
3. ASPHALT THICKNESS SHOWN IS FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS SHALL HAVE A MINIMUM THICKNESS OF 5.5".
4. ASPHALT DRIVEWAY APRONS AT CONCRETE STREETS ARE NOT ALLOWED.
5. RESIDENTIAL LOCAL - MIN RADIUS = 5', MAX = 10'. RESIDENTIAL COLLECTOR - MIN RADIUS 8', MAX RADIUS 10'.
6. MAX CURB CUT: LOCAL = 40', COLLECTOR = 46'

STREETS
LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

ASPHALT DRIVEWAY
AT
ASPHALT STREET


VARIES (12' MIN - 30' MAX)
A
INSTALL MINIMUM 2' WIDE DRIVEWAY ASPHALT TRANSITION SECTION WHEN CONNECTING TO ASPHALT OR GRAVEL DRIVEWAYS ONLY
7" THICKENED EDGE
INSTALL EXPANSION JOINT WHEN CONNECTING TO CONCRETE DRIVEWAYS ONLY
CITY OF LONGVIEW ROW
ROW
ROW
CLASS P CONCRETE
3' (MIN)
EXPANSION JOINT
2% MAX
PROVIDE SAW CONTRACTION JOINTS AS REQUIRED SPACING BETWEEN CONTRACTION JOINTS SHALL NOT EXCEED 10 FEET
RADIUS SEE NOTE 8
SIDEWALKS AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
SIDEWALK WIDTH VARIES 4' (TYP)
SLOPE VARIES
MONOLITHIC CURB TYPICAL STANDARD 24" CURB AND GUTTER ONLY IF APPROVED BY THE CITY OF LONGVIEW
2'
FLOW LINE OF GUTTER
A
#3 REBAR @ 18" OCEW
SAWCUT OR BLOCKOUT LINE SEE NOTES
PLAN VIEW
TAPERED CURB BEYOND
REFER TO CITY OF LONGVIEW STANDARD DETAILS FOR PAVEMENT THICKNESS
ROAD SURFACE
ELEVATION LEVEL WITH TOP OF STREET CURB
TAPERED CURB
3' ADA PATH
5"
DRIVEWAY TRANSITION
SECTION A-A
7" THICKENED EDGE
#3 REBAR @ 18" OCEW

NOTES:

1. EXISTING PAVEMENT - SAWCUT AND REMOVE EXISTING CONCRETE PAVEMENT AND CURB AND GUTTER AT BLOCKOUT LINE.
2. NEW PAVEMENT - CONSTRUCT NEW PAVEMENT TO BLOCKOUT LINE.
3. CONSTRUCTION EXPANSION JOINT AT SAWCUT/BLOCKOUT LINE AT PAVEMENT WITH SMOOTH DOWEL BARS AT 12" OC. DRILL AND EPOXY INTO EXISTING PAVEMENT. GREASE AND INSTALL GREASE CAP IN DRIVEWAY CONCRETE.
4. CONSTRUCT CURB AND GUTTER EXPANSION JOINT WITH TWO #4 SMOOTH BARS CENTERED IN GUTTER.
5. REFER TO CITY OF LONGVIEW STANDARD DETAILS FOR EXPANSION JOINTS AND SEALING.
6. CONCRETE THICKNESS SHOWN IS FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS SHALL HAVE A MINIMUM THICKNESS OF 5.5".
7. CONCRETE DRIVEWAY APRONS ARE REQUIRED AT ALL CONCRETE STREET.
8. RESIDENTIAL LOCAL - MIN RADIUS = 5', MAX = 10'. RESIDENTIAL COLLECTOR - MIN RADIUS 8', MAX RADIUS 10'.
9. MAX CURB CUT: LOCAL = 40', COLLECTOR = 46'

STREETS

LATEST REVISION:
3/21/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

CONCRETE DRIVEWAY
AT
CONCRETE STREET

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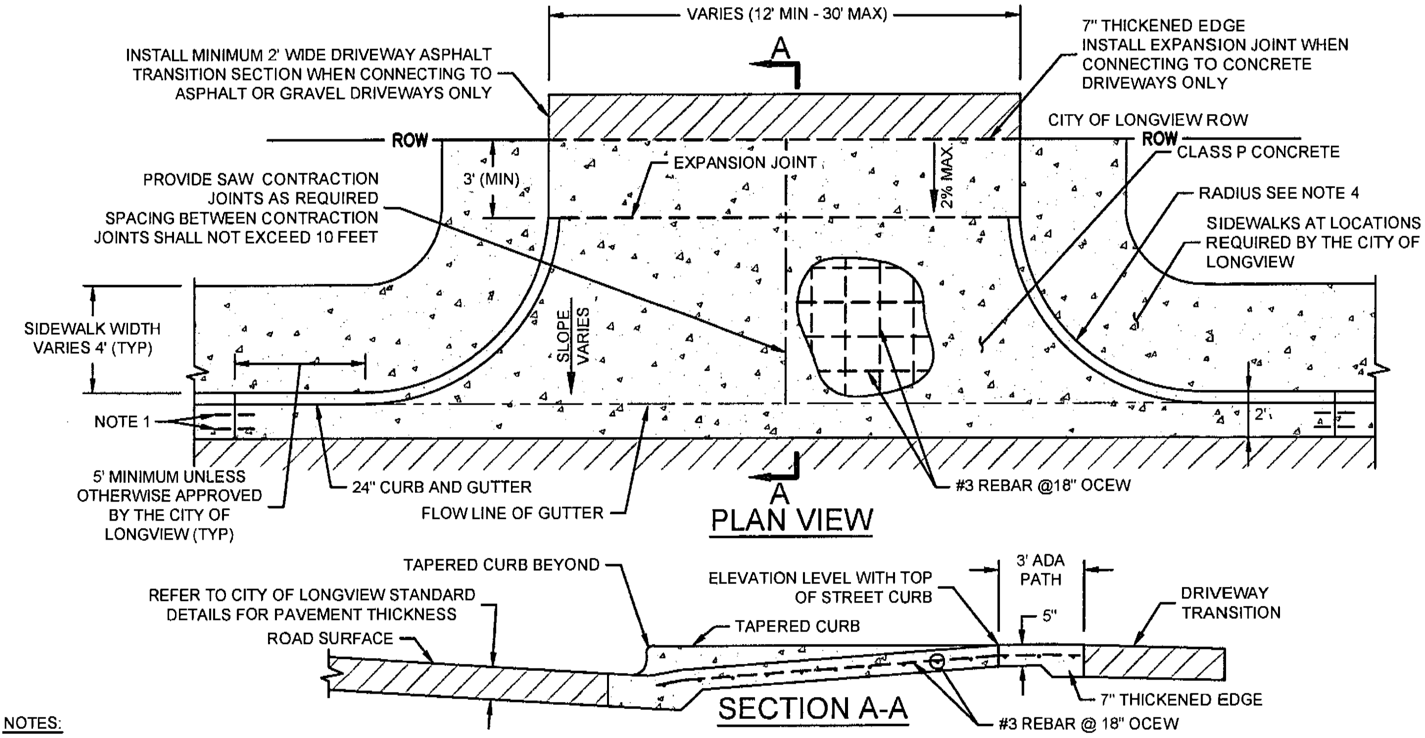
VARIES (12' MIN - 30' MAX)
A
INSTALL MINIMUM 2' WIDE DRIVEWAY ASPHALT TRANSITION SECTION WHEN CONNECTING TO ASPHALT OR GRAVEL DRIVEWAYS ONLY
7" THICKENED EDGE
INSTALL EXPANSION JOINT WHEN CONNECTING TO CONCRETE DRIVEWAYS ONLY
CITY OF LONGVIEW ROW
ROW
ROW
CLASS P CONCRETE
3' (MIN)
EXPANSION JOINT
2% MAX
PROVIDE SAW CONTRACTION JOINTS AS REQUIRED
SPACING BETWEEN CONTRACTION JOINTS SHALL NOT EXCEED 10 FEET
RADIUS SEE NOTE 4
SIDEWALKS AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
SIDEWALK WIDTH VARIES 4' (TYP)
SLOPE VARIES
NOTE 1
2'
5' MINIMUM UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW (TYP)
24" CURB AND GUTTER
FLOW LINE OF GUTTER
A
#3 REBAR @18" OCEW
PLAN VIEW
TAPERED CURB BEYOND
REFER TO CITY OF LONGVIEW STANDARD DETAILS FOR PAVEMENT THICKNESS
ROAD SURFACE
ELEVATION LEVEL WITH TOP OF STREET CURB
3' ADA PATH
5"
DRIVEWAY TRANSITION
TAPERED CURB
7" THICKENED EDGE
SECTION A-A
#3 REBAR @ 18" OCEW

NOTES:

1. WHEN CONNECTING TO EXISTING CURB AND GUTTER: SAWCUT AND REMOVE EXISTING CURB AND GUTTER TO THE LIMITS REQUIRED BY THE CITY OF LONGVIEW. CONSTRUCT CURB AND GUTTER EXPANSION JOINTS PER CITY OF LONGVIEW STANDARD AT EACH CURB AND GUTTER TIE - IN.

2. FOR NEW CURB AND GUTTER AT NEW DRIVEWAY, INSTALL EXPANSION JOINT IN CURB AND GUTTER AT 5 FEET FROM END OF EACH DRIVEWAY CURB RETURN OR AS APPROVED BY THE CITY OF LONGVIEW.

3. CONCRETE THICKNESS SHOWN IS FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS SHALL HAVE A MINIMUM THICKNESS OF 5.5".

4. RESIDENTIAL LOCAL - MIN RADIUS = 5', MAX = 10'. RESIDENTIAL COLLECTOR - MIN RADIUS 8', MAX RADIUS 10'.

5. MAX CURB CUT: LOCAL = 40', COLLECTOR = 46'

	STREETS LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	CONCRETE DRIVEWAY AT ASPHALT STREET

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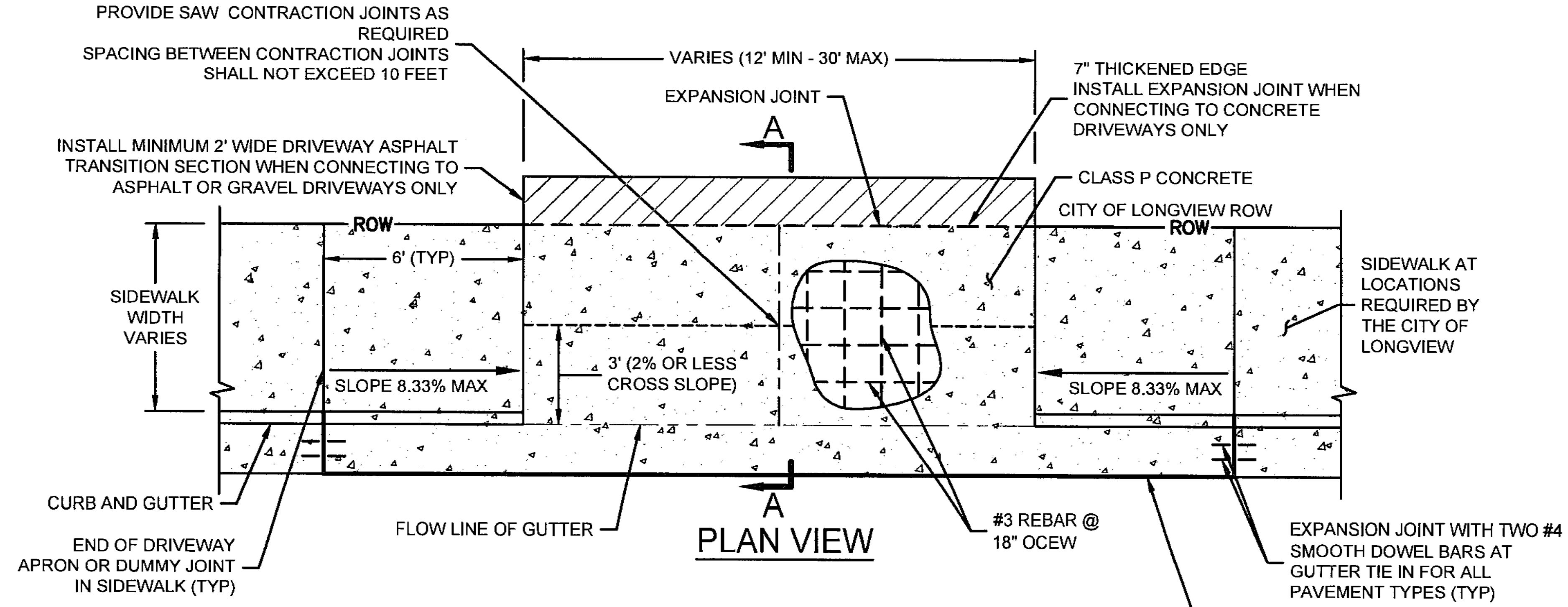
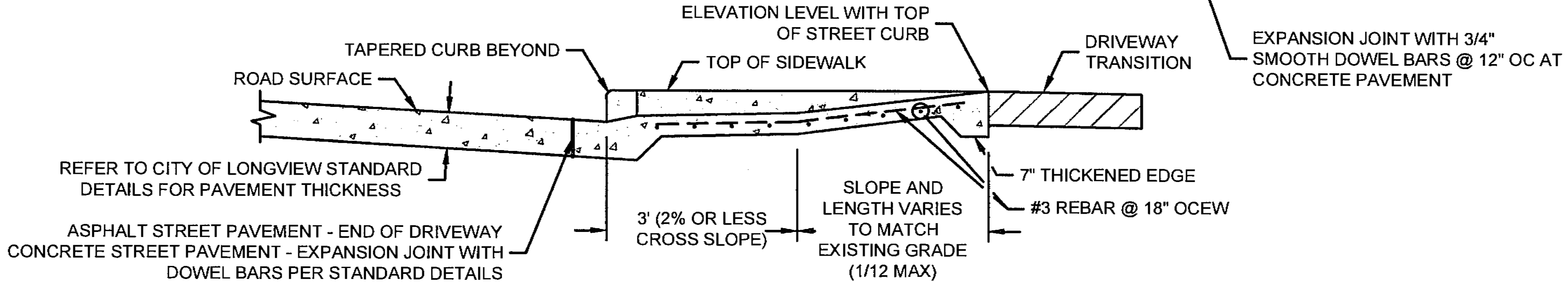

PROVIDE SAW CONTRACTION JOINTS AS REQUIRED
SPACING BETWEEN CONTRACTION JOINTS SHALL NOT EXCEED 10 FEET
VARIES (12' MIN - 30' MAX)
EXPANSION JOINT
A
7" THICKENED EDGE
INSTALL EXPANSION JOINT WHEN CONNECTING TO CONCRETE DRIVEWAYS ONLY
INSTALL MINIMUM 2' WIDE DRIVEWAY ASPHALT TRANSITION SECTION WHEN CONNECTING TO ASPHALT OR GRAVEL DRIVEWAYS ONLY
CLASS P CONCRETE
CITY OF LONGVIEW ROW
ROW
ROW
SIDEWALK WIDTH VARIES
6' (TYP)
3' (2% OR LESS CROSS SLOPE)
SLOPE 8.33% MAX
SLOPE 8.33% MAX
SIDEWALK AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
CURB AND GUTTER
END OF DRIVEWAY APRON OR DUMMY JOINT IN SIDEWALK (TYP)
FLOW LINE OF GUTTER
A
#3 REBAR @ 18" OCEW
EXPANSION JOINT WITH TWO #4 SMOOTH DOWEL BARS AT GUTTER TIE IN FOR ALL PAVEMENT TYPES (TYP)
EXPANSION JOINT WITH 3/4" SMOOTH DOWEL BARS @ 12" OC AT CONCRETE PAVEMENT

PLAN VIEW

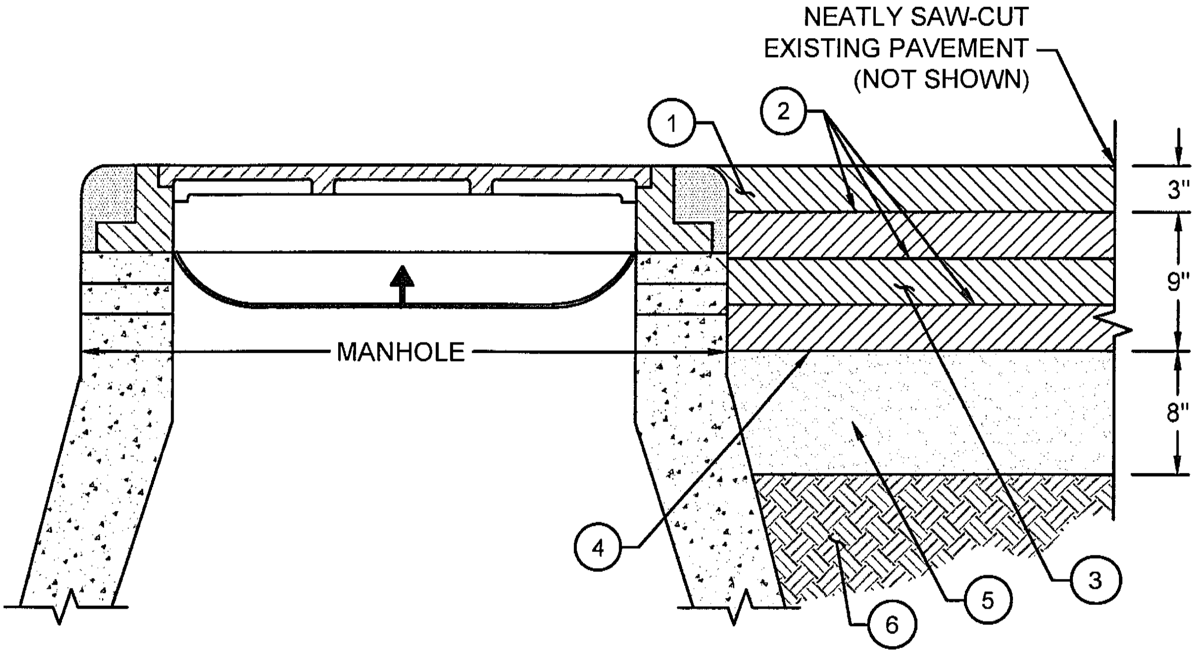

ELEVATION LEVEL WITH TOP OF STREET CURB
TAPERED CURB BEYOND
TOP OF SIDEWALK
DRIVEWAY TRANSITION
ROAD SURFACE
REFER TO CITY OF LONGVIEW STANDARD DETAILS FOR PAVEMENT THICKNESS
7" THICKENED EDGE
#3 REBAR @ 18" OCEW
SLOPE AND LENGTH VARIES TO MATCH EXISTING GRADE (1/12 MAX)
3' (2% OR LESS CROSS SLOPE)
ASPHALT STREET PAVEMENT - END OF DRIVEWAY
CONCRETE STREET PAVEMENT - EXPANSION JOINT WITH DOWEL BARS PER STANDARD DETAILS

SECTION A-A

NOTES:

1. WHEN CONNECTING TO EXISTING CURB AND GUTTER: SAWCUT AND REMOVE EXISTING CURB AND GUTTER TO THE LIMITS REQUIRED BY THE CITY OF LONGVIEW. CONSTRUCT CURB AND GUTTER EXPANSION JOINTS PER CITY OF LONGVIEW STANDARD AT EACH CURB AND GUTTER TIE - IN.
2. FOR NEW CURB AND GUTTER AT NEW DRIVEWAY, INSTALL EXPANSION JOINT IN CURB AND GUTTER AT END OF EACH DRIVEWAY FLARE OR AS APPROVED BY THE CITY OF LONGVIEW.
3. CONCRETE THICKNESS SHOWN IS FOR RESIDENTIAL DRIVEWAYS. COMMERCIAL DRIVEWAYS SHALL HAVE A MINIMUM THICKNESS OF 6".

STREETS LATEST REVISION: 7/29/2020	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	CONCRETE DRIVEWAY



MARK	DESCRIPTION
①	3" OF HMAC, TXDOT ITEM 340, TYPE C, COMPACTED USING AIR VOID CONTROL METHOD.
②	AR-4000 TACK COAT MECHANICALLY APPLIED AT A MAXIMUM RATE OF 0.25 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF. THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS. TACK COAT SHALL BE APPLIED BETWEEN ALL LAYERS OF HMAC.
③	9" OF HMAC, TXDOT ITEM 340, TYPE B, INSTALLED IN THREE 3" LIFTS AND COMPACTED USING AIR VOID CONTROL METHOD. A TACK COAT SHALL BE APPLIED BETWEEN THE THREE LIFTS.
④	MC-30 PRIME COAT APPLIED AT A MAXIMUM RATE OF 0.25 GALLONS PER SQUARE YARD. RATE OF APPLICATION SHALL BE ADJUSTED IN THE FIELD TO PROVIDE UNIFORM COVERAGE WITHOUT RUNOFF. THE RATE SHALL BE APPROVED BY THE CITY OF LONGVIEW, BASED UPON FIELD TESTS.
⑤	8" CEMENT TREATED SUBGRADE INSTALLED IN ACCORDANCE WITH TXDOT ITEM 275. TYPE I, TYPE II, OR TYPE I/III PORTLAND CEMENT SHALL BE ADDED TO THE SUBGRADE AFTER REMOVAL OF ALL DEBRIS. THE CEMENT APPLICATION RATE SHALL BE 4% (30 LBS PER SQUARE YARD). THE PULVERIZATION REQUIREMENT SHALL BE 60% PASSING THE No. 4 SIEVE. THE FINAL COMPACTION SHALL BE A MINIMUM OF 95%± OF STANDARD PROCTOR (ASTM D-698) AT A MOISTURE CONTENT OF -4% TO +1% OF OPTIMUM MOISTURE.
⑥	BACKFILL EXCAVATION WITH SELECT FILL (TYP S3). COMPACT IN 8" HORIZONTAL LIFTS TO 95% OF MAXIMUM DENSITY WITHIN 2% OF OPTIMUM MOISTURE (ASTM D-698)

NOTE:

CONCRETE STREETS -TOP 12" SHALL BE TxDOT CLASS P CONCRETE WITH A MINIMUM COMPRESSIVE OF 4,400 PSI AT 28 DAYS. INSTALL EXPANSION JOINTS ON ALL SIDES OF CONCRETE PAVEMENT REPAIR WITH #8 x 18" SMOOTH DOWELS DRILL AND EPOXY AT 12" OC AT CENTER OF PAVEMENT. GREASE AND GREASE CAPS ON DOWELS INSIDE CONCRETE PAVEMENT REPAIR.

	STREETS LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PAVEMENT REPAIR AT MANHOLE

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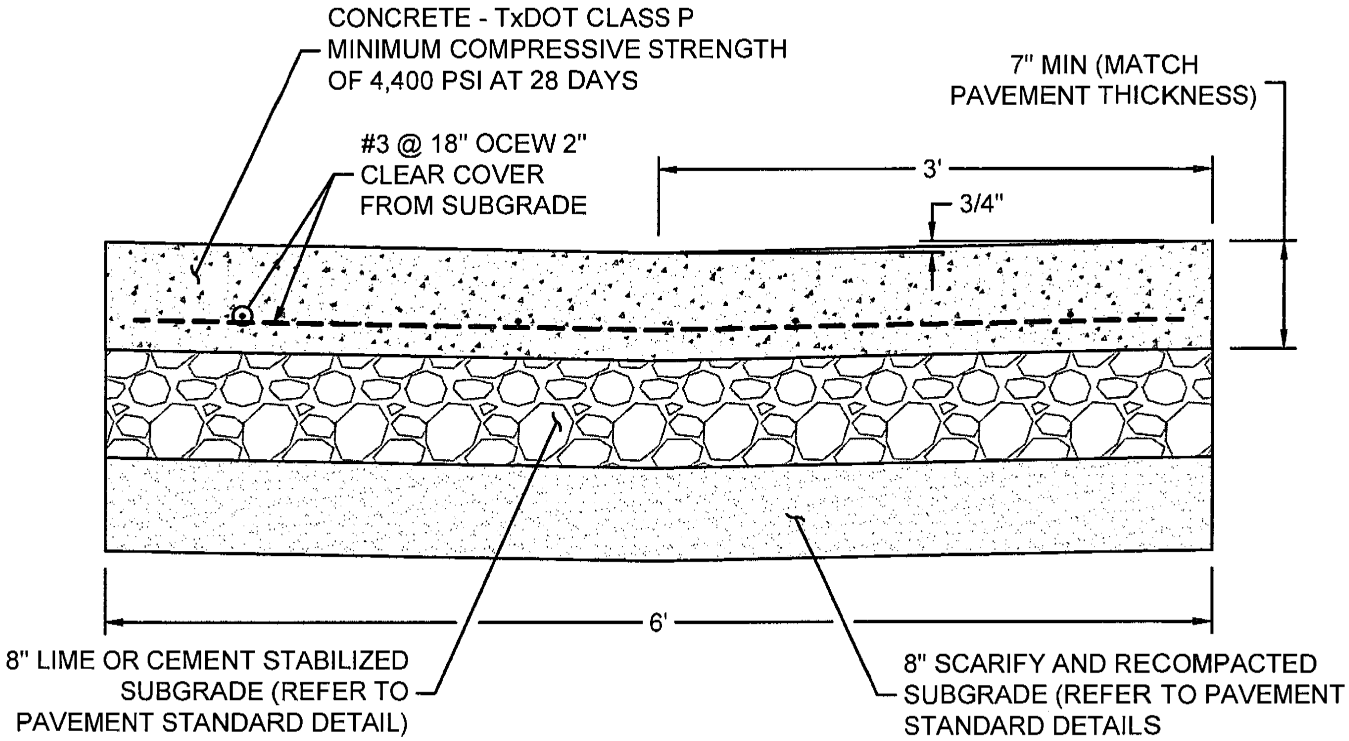
CONCRETE - TxDOT CLASS P
MINIMUM COMPRESSIVE STRENGTH
OF 4,400 PSI AT 28 DAYS
7" MIN (MATCH
PAVEMENT THICKNESS)
#3 @ 18" OCEW 2"
CLEAR COVER
FROM SUBGRADE
3'
3/4"
6'
8" LIME OR CEMENT STABILIZED
SUBGRADE (REFER TO
PAVEMENT STANDARD DETAIL)
8" SCARIFY AND RECOMPACTED
SUBGRADE (REFER TO PAVEMENT
STANDARD DETAILS

NOTES:

1. REINFORCEMENT SHALL BE CONTINUOUS WITH MINIMUM 30" LAP AT BARS.
2. CONCRETE PAVEMENT:
   a. MATCH JOINT LOCATIONS AND TYPES FOR CONCRETE PAVEMENTS.
   b. AT CONCRETE PAVEMENT TRANSITIONS AND INTERSECTIONS, INSTALL EXPANSION JOINTS WITH #8 x 18" SMOOTH DOWEL BARS @ 12" OC. CENTERED IN PAVEMENT. REFER TO PAVEMENT STANDARD DETAILS.
3. FOR ASPHALT PAVEMENT:
   a. INSTALL CONTRACTION JOINT AT CENTERLINE AND OFFSET NO MORE THAN 15 FEET OCEW.

STREETS LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	CONCRETE VALLEY GUTTER

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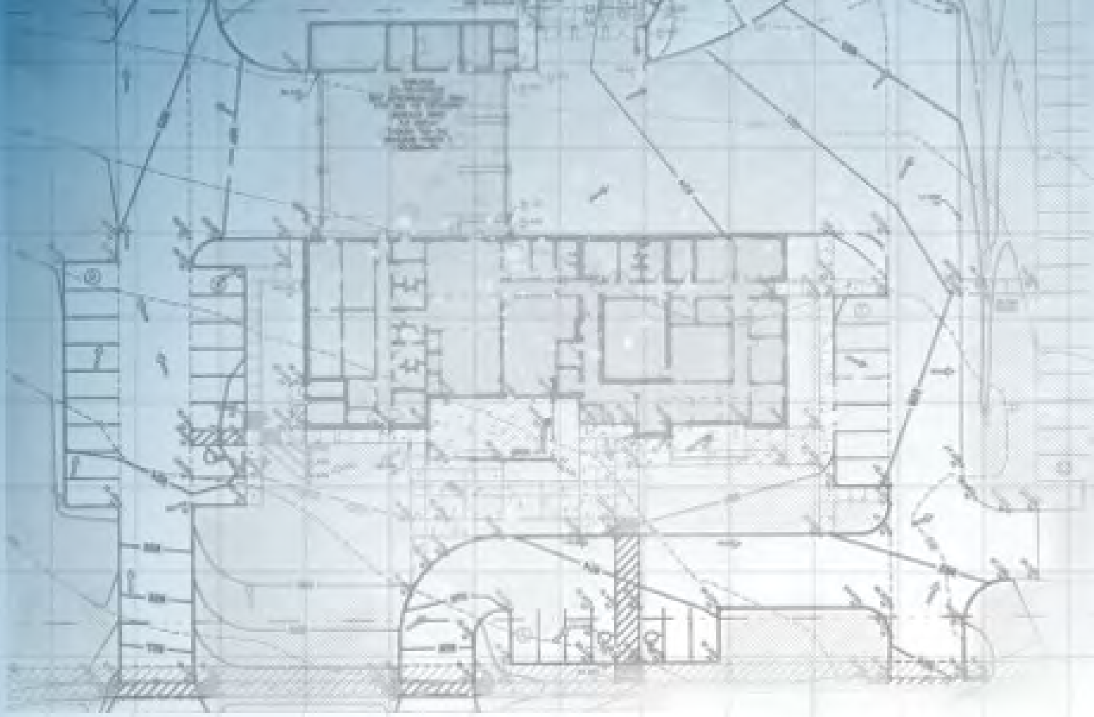
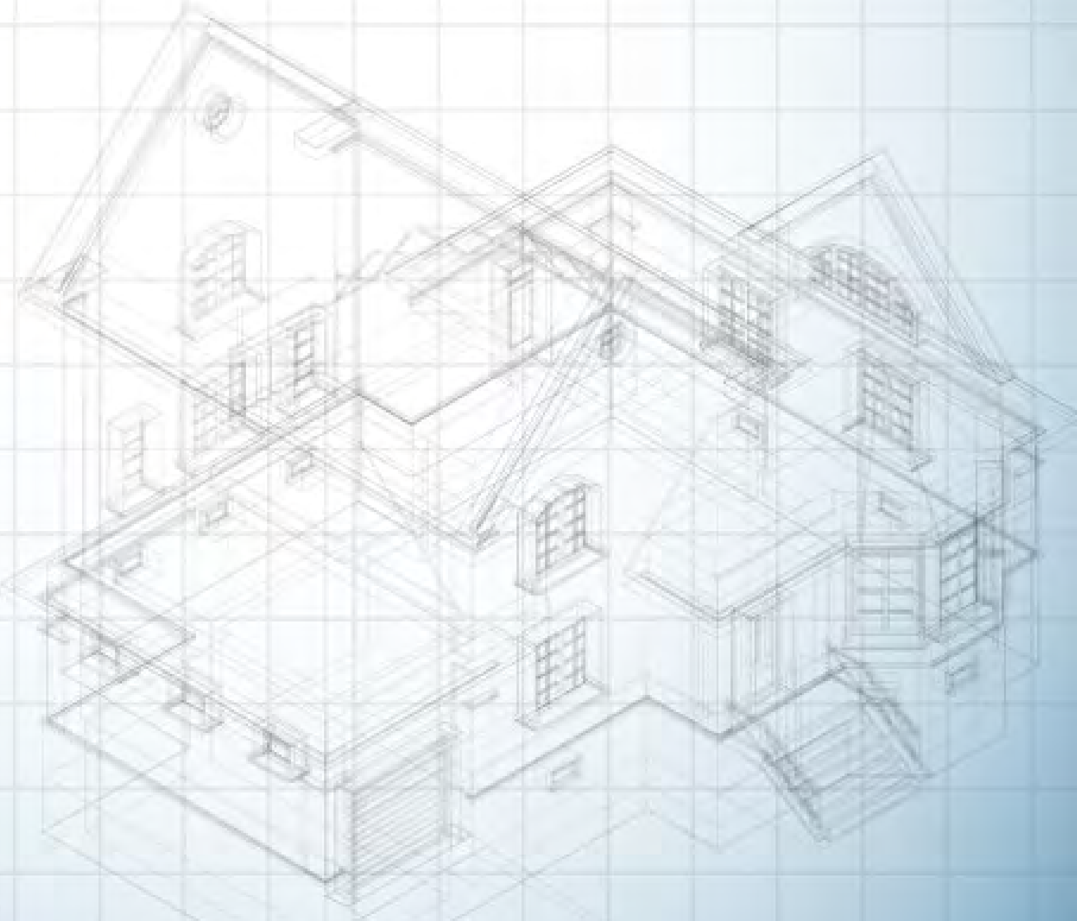
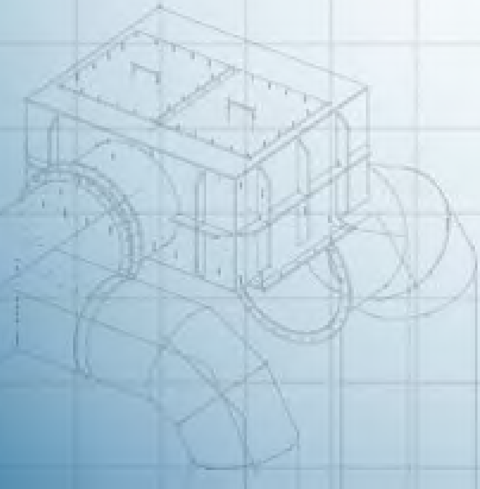


Engineering Details - Water Utilities





WATER UTILITIES DETAILS

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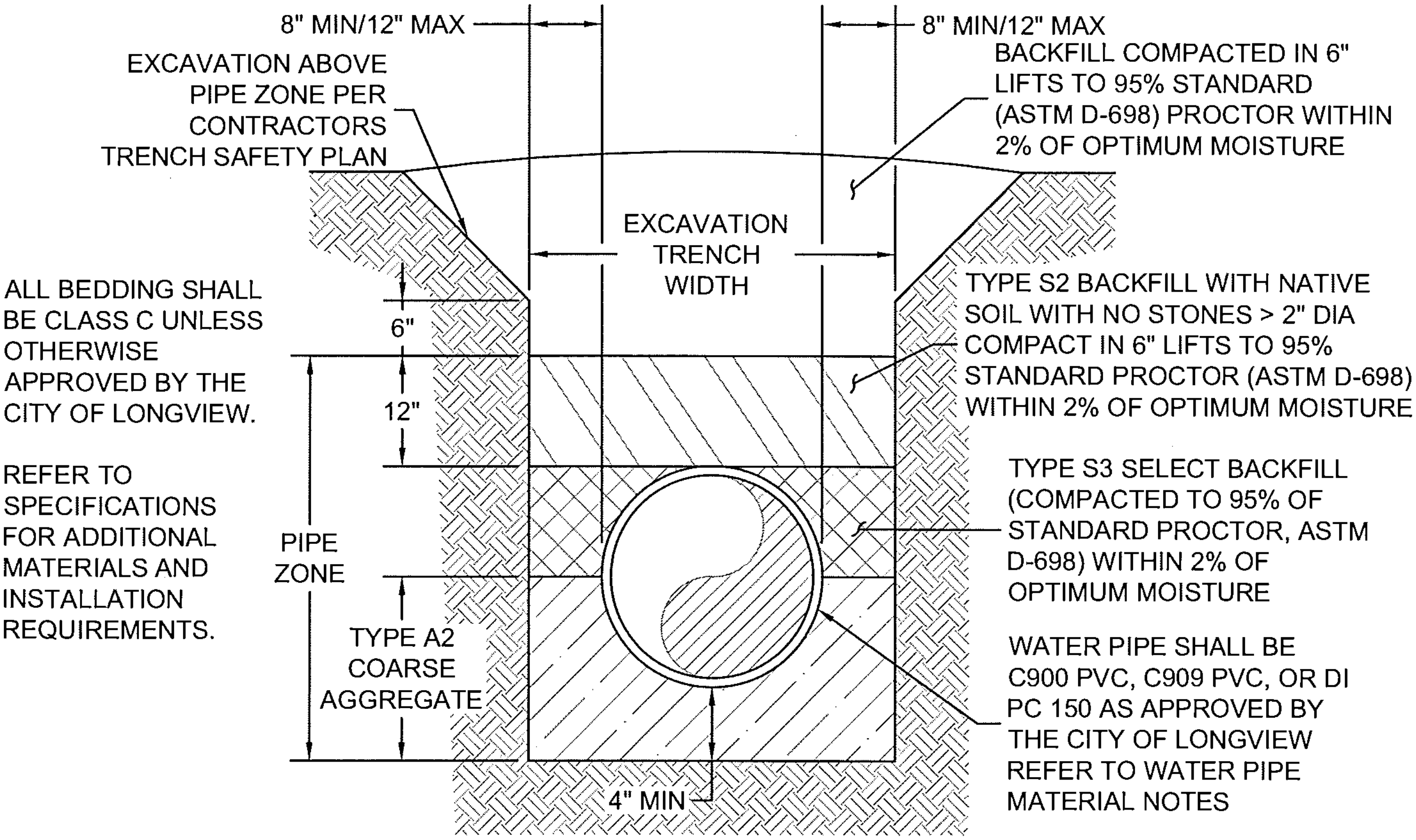
Fire Line Detector Check Valve Assembly 24
Marker Sign Detail 25


8" MIN/12" MAX
8" MIN/12" MAX
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
BACKFILL COMPACTED IN 6" LIFTS TO 95% STANDARD (ASTM D-698) PROCTOR WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION TRENCH WIDTH
ALL BEDDING SHALL BE CLASS C UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
6"
12"
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT IN 6" LIFTS TO 95% STANDARD PROCTOR (ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
REFER TO SPECIFICATIONS FOR ADDITIONAL MATERIALS AND INSTALLATION REQUIREMENTS.
PIPE ZONE
TYPE S3 SELECT BACKFILL (COMPACTED TO 95% OF STANDARD PROCTOR, ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
TYPE A2 COARSE AGGREGATE
WATER PIPE SHALL BE C900 PVC, C909 PVC, OR DI PC 150 AS APPROVED BY THE CITY OF LONGVIEW REFER TO WATER PIPE MATERIAL NOTES
4" MIN

TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

GENERAL NOTES:

1. PIPE AND FITTINGS SHALL BE INSTALLED AND TESTED PER AWWA C600 OR C605 AS APPLICABLE.
2. WATER LINES SHALL BE DISINFECTED AND TESTED PER AWWA C651. TEST RESULTS SHALL BE SUBMITTED TO THE CITY OF LONGVIEW.
3. ALL BELOW GRADE FITTINGS SHALL BE DIMJ WITH RETAINING GLANDS AND THRUST BLOCKING.
4. PROVIDED AND INSTALL ADDED RESTRAINT AND USING SS ALL-THREADS AT LOCATIONS DESIGNATED BY THE CITY OF LONGVIEW.
5. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE INSTALLATION CLASS C EMBEDMENT

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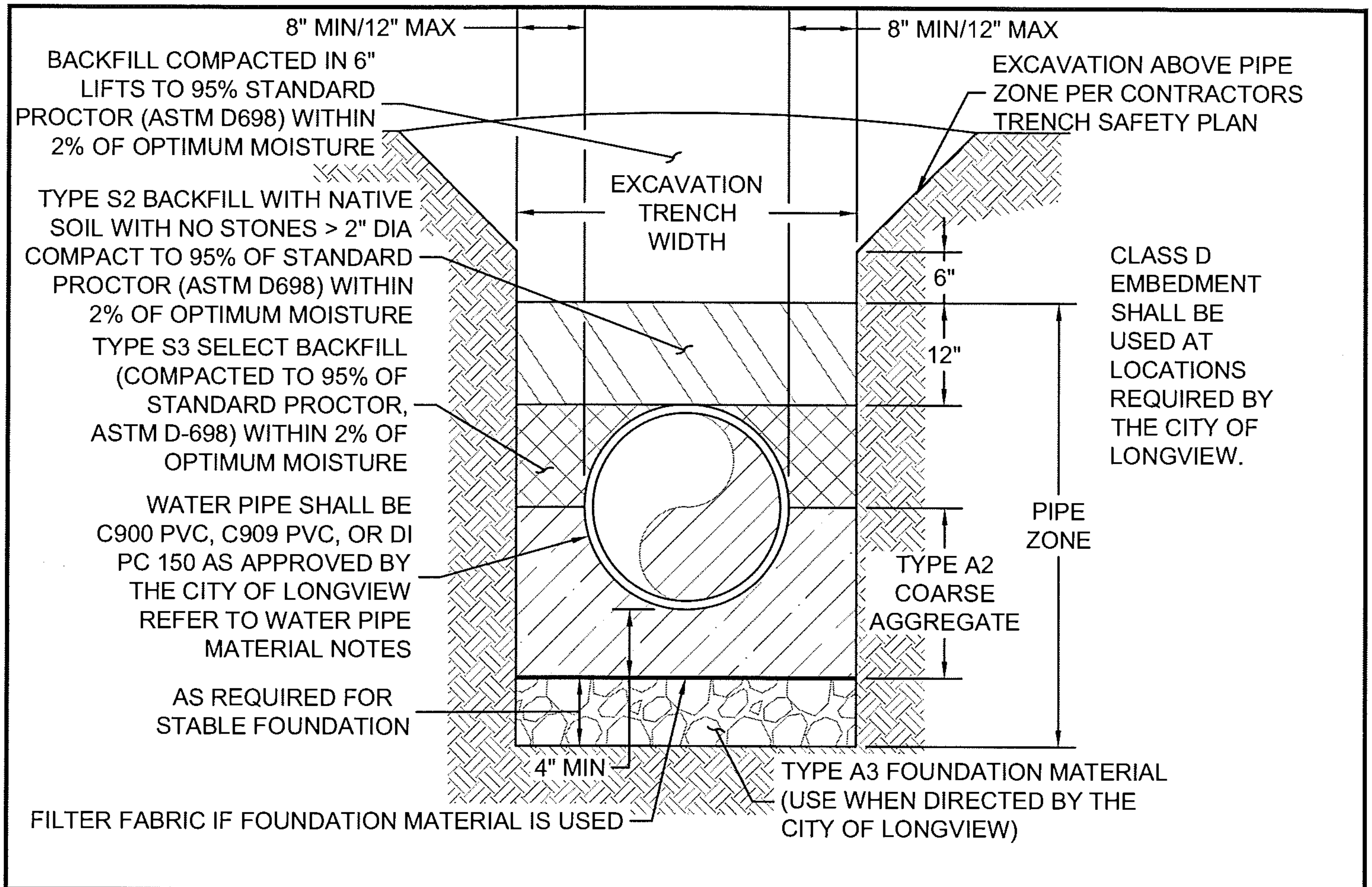

8" MIN/12" MAX
8" MIN/12" MAX
BACKFILL COMPACTED IN 6" LIFTS TO 95% STANDARD PROCTOR (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION ABOVE PIPE ZONE PER CONTRACTORS TRENCH SAFETY PLAN
TYPE S2 BACKFILL WITH NATIVE SOIL WITH NO STONES > 2" DIA COMPACT TO 95% OF STANDARD PROCTOR (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE
EXCAVATION TRENCH WIDTH
6"
12"
CLASS D EMBEDMENT SHALL BE USED AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW.
TYPE S3 SELECT BACKFILL (COMPACTED TO 95% OF STANDARD PROCTOR, ASTM D-698) WITHIN 2% OF OPTIMUM MOISTURE
PIPE ZONE
WATER PIPE SHALL BE C900 PVC, C909 PVC, OR DI PC 150 AS APPROVED BY THE CITY OF LONGVIEW REFER TO WATER PIPE MATERIAL NOTES
TYPE A2 COARSE AGGREGATE
AS REQUIRED FOR STABLE FOUNDATION
4" MIN
TYPE A3 FOUNDATION MATERIAL (USE WHEN DIRECTED BY THE CITY OF LONGVIEW)
FILTER FABRIC IF FOUNDATION MATERIAL IS USED

TYPE A2	ANGULAR 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 NO. 57. EMBEDMENT MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.
TYPE A3	COARSE STONE OR CRUSHED GRAVEL. FOUNDATION MATERIAL SHALL BE PIT RUN ANGULAR CRUSHED, NATURAL WASHED STONE FREE OF SHALE, CLAY, FRIABLE MATERIAL AND DEBRIS; WELL GRADED BETWEEN 1" AND 3" IN SIZE, WITH A MINIMUM OF 90% RETAINED ON A 1" SIEVE.
TYPE S2	GRADED FREE OF LUMPS LARGER THAN 3", ROCKS LARGER THAN 2", EXCESSIVE SILTS, AND DEBRIS. DO NOT USE SOIL CONTAINING BRUSH, ROOTS, OR SIMILAR ORGANIC MATTER. CONFORMING TO ASTM D2487 CLASS II OR CLASS III SOILS WITH A LIQUID LIMIT LESS THAN 40, AND THE PLASTICITY INDEX LESS THAN 20, BUT GREATER THAN 4.
TYPE S3	CLAYEY SAND SOILS FREE FROM ORGANIC MATTER WITH NO LUMPS LARGER THAN 1", NO ROCKS LARGER THAN 1/2", NOR EXCESSIVE SILTS. DO NOT USE SOILS CONTAINING BRUSH, ROOTS, SOD, OR OTHER ORGANIC MATERIALS. SELECT FILL SHALL CONFORM TO ASTM D2487 CLASS II OR CLASS III AND SHALL HAVE A LIQUID LIMIT LESS THAN 30 WITH PLASTICITY INDEX LESS THAN 15, BUT GREATER THAN 4.

GENERAL NOTES:

1. PIPE AND FITTINGS SHALL BE INSTALLED AND TESTED PER AWWA C600 OR C605 AS APPLICABLE.
2. WATER LINES SHALL BE DISINFECTED AND TESTED PER AWWA C651 TEST RESULTS SHALL BE SUBMITTED TO THE CITY OF LONGVIEW.
3. ALL BELOW GRADE FITTINGS SHALL BE DIMJ WITH RETAINING GLANDS AND THRUST BLOCKING.
4. PROVIDED AND INSTALL ADDED RESTRAINT USING SS AND ALL-THREADS AT LOCATIONS DESIGNATED BY THE CITY OF LONGVIEW.
5. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

WATER

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

WATERLINE INSTALLATION
CLASS D EMBEDMENT

WATER PIPE MATERIAL DETAIL NOTES:

A. DUCTILE IRON WATER PIPE

1. ALL DUCTILE IRON WATER PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C150/A21.50 AND ANSI/AWWA C151/A21.51.
2. DUCTILE IRON WATER PIPE SHALL BE AT LEAST PRESSURE CLASS 150.
3. ALL PIPES SHALL BEAR THE NSF SEAL OF APPROVAL.
4. INTERIOR SURFACES SHALL BE CEMENT LINED PER AWWA C104.
5. EXTERIOR SURFACES SHALL BE COATED WITH BITUMINOUS COATING PER AWWA C110.
6. PIPE SHALL BE FREE FROM EXCESSIVE PITS, SCARS, OR OTHER SURFACE DEFECTS.
7. JOINTS SHALL BE INTEGRAL BELL WITH FLEXIBLE ELASTOMERIC SEAL PER AWWA C111.
8. ALL WATERLINES SHALL BE INSTALLED WITH TRACER WIRE.
9. ALL DUCTILE IRON PIPE, FITTINGS, AND APPURTENANCES SHALL BE WRAPPED IN EIGHT MIL POLYETHYLENE AND TAPE ENCASEMENT PER AWWA C105.

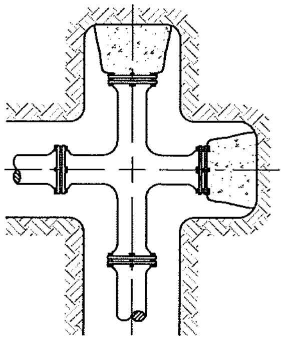
B. PVC WATER PIPE

1. AWWA C900 AND AWWA C905 PIPE FOUR INCHES AND LARGER IN DIAMETER SHALL BE DR 18 PRESSURE CLASS 235.
2. AWWA C909 PIPE SHALL BE PRESSURE CLASS 235.
3. PIPE LESS THAN FOUR INCHES IN DIAMETER SHALL BE TYPE 1, GRADE 1, POLYVINYL CHLORIDE, SCHEDULE 40 PIPE CONFORMING TO ASTM D1785.
4. BLUE PIPE SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
5. ALL PIPE SHALL BEAR THE NSF SEAL OF APPROVAL.
6. FOR PIPE TWO INCHES AND LARGER IN DIAMETER, THE JOINTS SHALL BE INTEGRAL BELL WITH A FLEXIBLE ELASTOMERIC SEAL. FOR PIPE SMALLER THAN TWO INCHES IN DIAMETER, JOINTS SHALL BE GLUED.
7. PIPE SHALL BE FREE OF EXCESSIVE PITS, SCARS, OR OTHER SURFACE DEFECTS
8. JOINTS SHALL BE INTEGRAL BELL WITH FLEXIBLE ELASTOMERIC SEAL PER AWWA STANDARDS
9. ALL PVC LINES SHALL BE INSTALLED WITH TRACER WIRE.

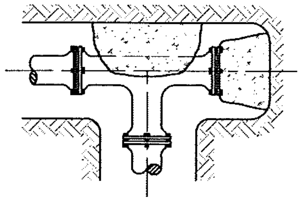
C. RESTRAINED JOINT PVC WATER PIPE

1. PIPE SHALL BE DR 18 PRESSURE CLASS 235.
2. ALL PIPE SHALL BEAR THE NSF SEAL OF APPROVAL.
3. THE RESTRAINED JOINT PIPE SYSTEM SHALL MEET ALL SHORT AND LONG TERM PRESSURE TEST REQUIREMENTS OF AWWA C900 AND C905.
4. PIPE AND COUPLING SHALL BE MADE FROM UNPLASTICIZED PVC COMPOUNDS HAVING A MINIMUM CELL CLASSIFICATION OF 12454-B AS DEFINED IN ASTM D1784.
5. THE COMPOUND SHALL QUALIFY FOR A HYDROSTATIC DESIGN BASE OF 4000 PSI OF WATER AT 73.4° F IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM D2837.
6. BLUE PIPE SHALL BE USED UNLESS OTHERWISE APPROVED BY THE CITY OF LONGVIEW.
7. RESTRAINED JOINT PVC PIPE PRODUCTS SHALL HAVE BEEN TESTED AND APPROVED BY AN INDEPENDENT THIRD-PARTY LABORATORY FOR CONTINUOUS USE AT RATED PRESSURES.
    a. COPIES OF AGENCY APPROVAL REPORTS OR PRODUCT LISTING SHALL BE PROVIDED TO THE CITY OF LONGVIEW IF REQUESTED.
    b. PRODUCTS INTENDED FOR CONTACT WITH POTABLE WATER SHALL BE EVALUATED, TESTED, AND CERTIFIED FOR CONFORMANCE WITH NSF STANDARD 61 OR THE HEALTH EFFECTS PORTION OF NSF STANDARD 14 BY AN ACCEPTABLE CERTIFYING ORGANIZATION WHEN REQUIRED BY THE REGULATORY AUTHORITY HAVING JURISDICTION.
8. PIPE SHALL BE JOINED USING NON-METALLIC COUPLINGS WHICH, TOGETHER, HAVE BEEN DESIGNED AS AN INTEGRAL SYSTEM FOR MAXIMUM RELIABILITY AND INTERCHANGEABILITY.
    a. HIGH-STRENGTH FLEXIBLE THERMOPLASTIC SPLINES SHALL BE INSERTED INTO MATING PRECISION-MACHINED GROOVES IN THE PIPE AND COUPLING TO PROVIDE FULL 360° RESTRAINT WITH EVENLY DISTRIBUTED LOADING.
    b. MJ GLAND ADAPTERS SHALL BE USED TO ANCHOR THIS RESTRAINED-JOINT PVC PIPE TO DUCTILE IRON ACCESSORIES SUCH AS FITTINGS AND VALVES.
    c. COUPLINGS SHALL BE DESIGNED FOR USE AT THE RATED PRESSURES OF THE PIPE WITH WHICH THEY ARE UTILIZED AND SHALL INCORPORATE TWIN ELASTOMERIC SEALING GASKETS MEETING THE REQUIREMENTS OF ASTM F477.
    d. JOINTS SHALL BE DESIGNED TO MEET THE LEAKAGE TEST REQUIREMENTS OF ASTM D3139.
9. ALL PVC LINES SHALL BE INSTALLED WITH TRACER WIRE.

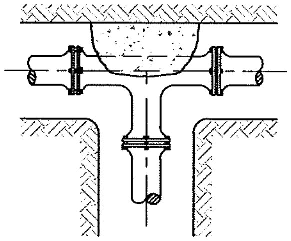
	WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE INSTALLATION GENERAL NOTES
	LATEST REVISION: 3/20/2018		



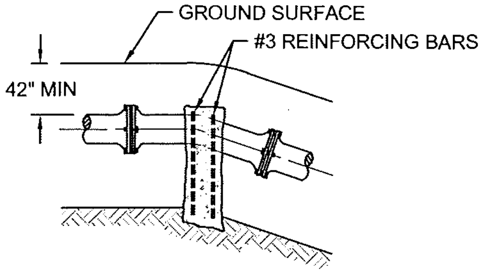
TYPICAL SECTION OF CROSS AND 2 PLUG BLOCKING
(WHEN DIRECTED BY CITY OF LONGVIEW)

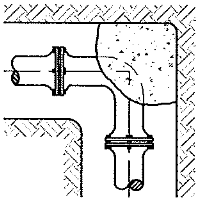


SPECIAL BLOCKING FOR TEE WITH PLUG
(WHEN DIRECTED BY CITY OF LONGVIEW)

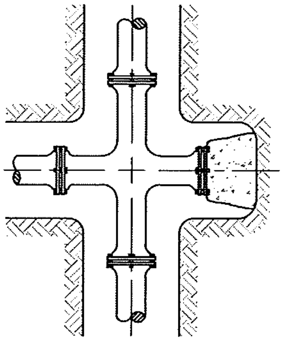


BLOCKING FOR TEE

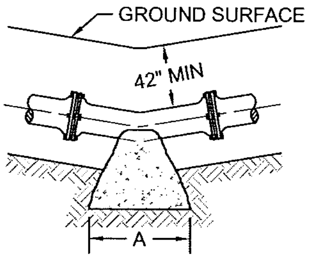




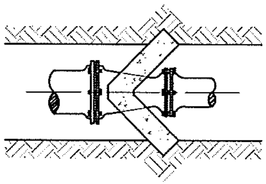
TYPICAL BLOCKING FOR HORIZONTAL BENDS



TYPICAL SECTION OF CROSS AND BLOCKING
(WHEN DIRECTED BY CITY OF LONGVIEW)



TYPICAL BLOCKING FOR VERTICAL BENDS



THRUST SUPPORT FOR REDUCER CONNECTION
(SIZE TO BE DETERMINED BY CITY OF LONGVIEW)

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	THRUST BLOCKING PAGE 1 OF 2

NOTES ON THRUST BLOCKING:

1. ALL BLOCKING SHALL BE AGAINST UNDISTURBED HAND DUG SOIL AND SHALL BE CONCRETE HAVING A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3,000 PSI.

2. THRUST CALCULATIONS TO BE BASED ON THRUST DUE TO WATER PRESSURE AT 100% OF TEST PRESSURE.

3. VERTICAL UPLIFT BLOCKS SHALL BE DESIGNED ON THE BASIS OF 150 LBS PER CU FT FOR CONCRETE AND SOIL AT 120 LBS PER CU FT OVER THE AREA OF BLOCK.

4. VERTICAL DOWN THRUST BLOCKS SHALL BE DESIGNED ON THE BASIS OF 3,000 LBS PER SQ FT ALLOWABLE SOIL BEARING PRESSURE. DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE CITY OF LONGVIEW OR MEASURED SOIL CONDITIONS. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO ALLOWABLE BEARING VALUE.

5. THRUST BLOCKS ON HORIZONTAL BENDS, TEES, CROSSES, AND REDUCERS SHALL BE SIZED BASED ON 2,400 LBS PER SQ FT OF BLOCKING SURFACE AREA IN CONTACT WITH UNDISTURBED SOIL, BLOCK DIMENSIONS MAY BE DECREASED WITH APPROVAL OF THE CITY OF LONGVIEW OR MEASURED SOIL CONDITIONS. IN POOR SOIL CONDITIONS, BLOCK DIMENSIONS SHALL BE INCREASED IN PROPORTION TO THE ALLOWABLE BEARING VALUE.

6. ALL BLOCKING SHALL HAVE A MINIMUM SOIL COVER OF TWO FEET.

7. ADDITIONAL REINFORCING MAY BE REQUIRED FOR HORIZONTAL BLOCKING TO HANDLE UNUSUAL SHEAR LOADING CONDITIONS.

8. ANCHOR COLLARS SHALL BE REINFORCED IN ACCORDANCE WITH REINFORCING BAR SCHEDULE FOR REDUCED BLOCKS SHOWN ABOVE. STEEL ANCHOR RING IN ACCORDANCE WITH DIMENSIONS OF ANCHOR COLLAR.

PIPE SIZE	TEES	BENDS			REDUCER		
	THRUST BLOCKING REQ'D (SF)	90° THRUST BLOCKING REQ'D (SF)	45° THRUST BLOCKING REQ'D (SF)	22 1/2° THRUST BLOCKING REQ'D (SF)	PIPE SIZE (IN)	ANGLE (THETA)	THRUST BLOCKING REQ'D (SF)
2 1/2"	0.61	0.43	0.23	0.12	4 - 3	8.2	0.05
3"	0.88	0.62	0.34	0.17	6 - 3	19.5	0.45
4"	1.57	1.11	0.60	0.31	6 - 4	12.8	0.22
6"	3.53	2.50	1.35	0.69	8 - 6	10.5	0.25
8"	6.28	4.44	2.40	1.23	10 - 8	9.6	0.30
10"	9.82	6.94	3.76	1.92	12 - 10	8.2	0.31
12"	14.14	10.00	5.41	2.76	14 - 12	7.2	0.32
14"	19.24	13.61	7.36	3.75	18 - 12	18.4	2.83
16"	25.13	17.77	9.62	4.90	20 - 14	17.5	3.04
18"	31.81	22.49	12.17	6.21	20 - 16	11.5	1.42
20"	39.27	27.77	15.03	7.66	24 - 18	14.5	3.12
24"	56.55	39.99	21.64	11.03	24 - 20	9.6	1.44
30"	88.36	62.48	33.81	17.24	30 - 20	19.5	8.30
36"	127.23	89.97	48.69	24.82	30 - 24	11.5	3.20

WATER

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

THRUST BLOCKING
PAGE 2 OF 2

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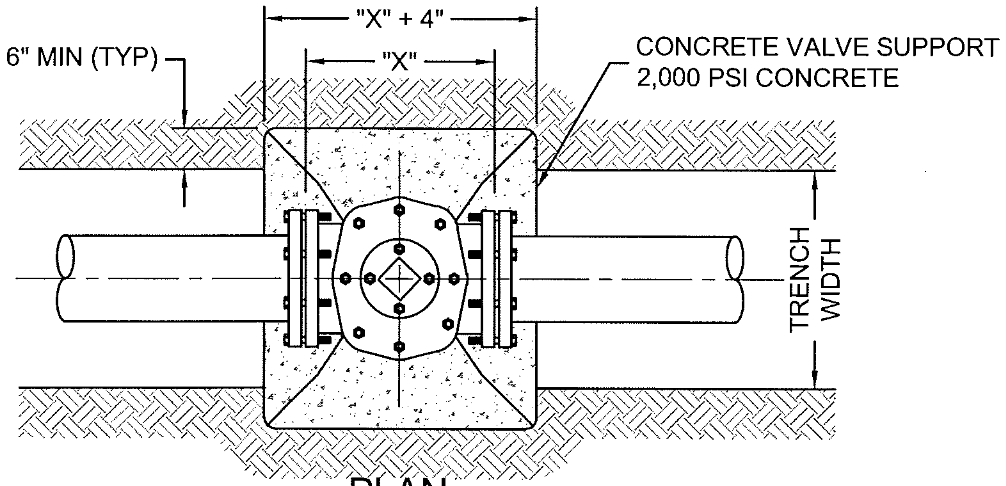
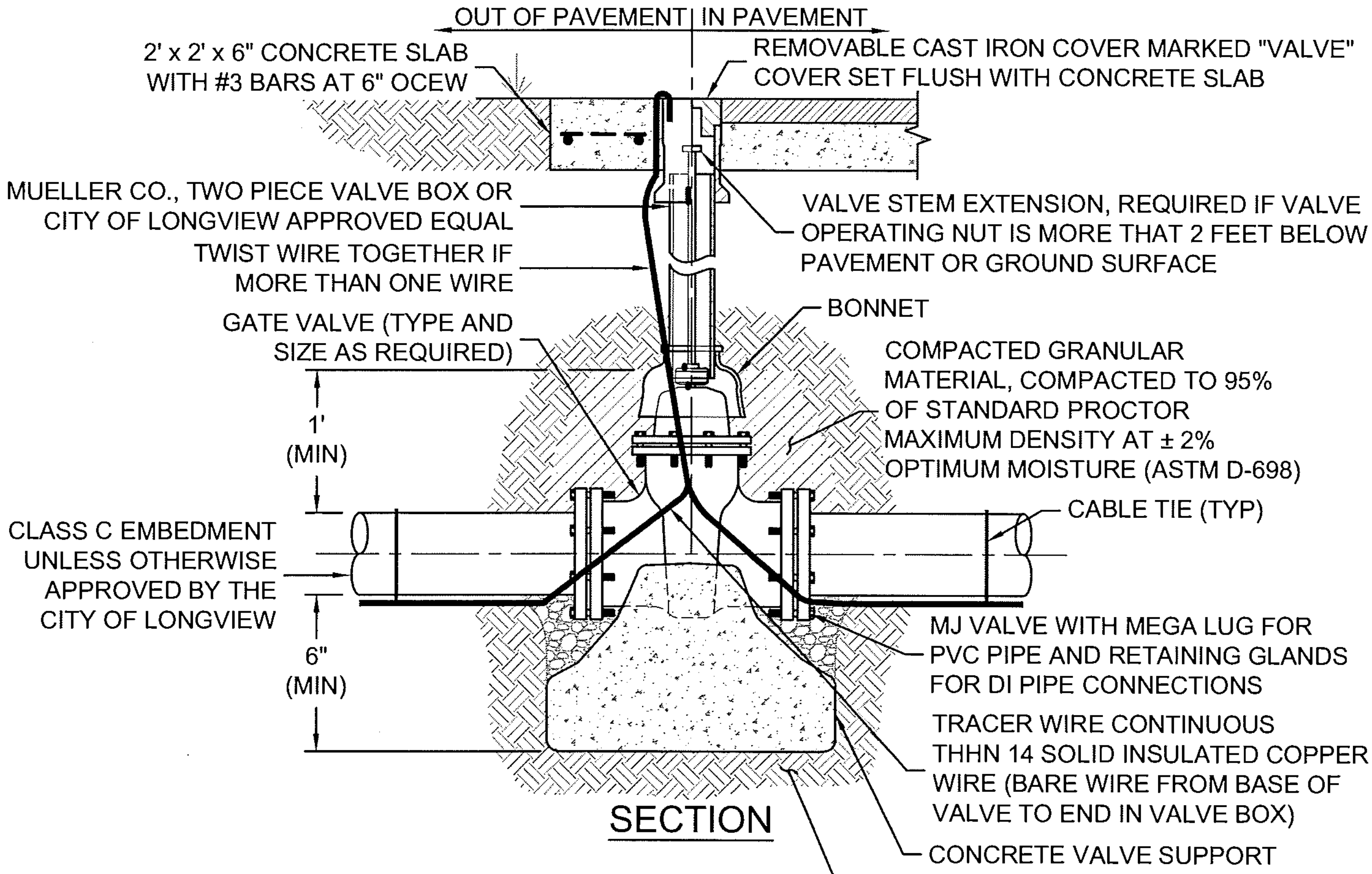

"X" + 4"
"X"
6" MIN (TYP)
CONCRETE VALVE SUPPORT
2,000 PSI CONCRETE
TRENCH WIDTH

PLAN

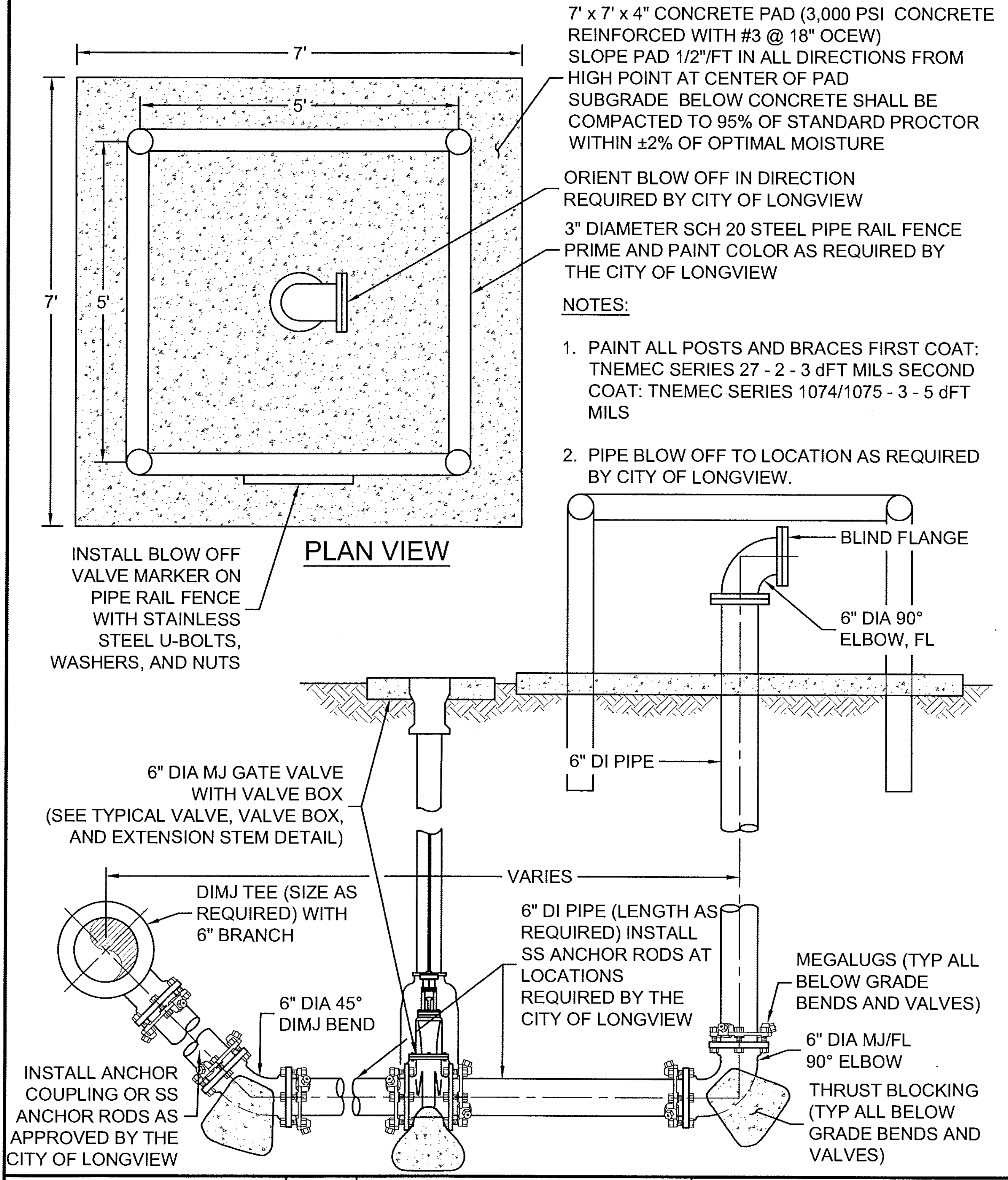

OUT OF PAVEMENT
IN PAVEMENT
2' x 2' x 6" CONCRETE SLAB
WITH #3 BARS AT 6" OCEW
REMOVABLE CAST IRON COVER MARKED "VALVE"
COVER SET FLUSH WITH CONCRETE SLAB
MUELLER CO., TWO PIECE VALVE BOX OR
CITY OF LONGVIEW APPROVED EQUAL
VALVE STEM EXTENSION, REQUIRED IF VALVE
OPERATING NUT IS MORE THAT 2 FEET BELOW
PAVEMENT OR GROUND SURFACE
TWIST WIRE TOGETHER IF
MORE THAN ONE WIRE
BONNET
GATE VALVE (TYPE AND
SIZE AS REQUIRED)
COMPACTED GRANULAR
MATERIAL, COMPACTED TO 95%
OF STANDARD PROCTOR
MAXIMUM DENSITY AT ± 2%
OPTIMUM MOISTURE (ASTM D-698)
1'
(MIN)
CABLE TIE (TYP)
CLASS C EMBEDMENT
UNLESS OTHERWISE
APPROVED BY THE
CITY OF LONGVIEW
6"
(MIN)
MJ VALVE WITH MEGA LUG FOR
PVC PIPE AND RETAINING GLANDS
FOR DI PIPE CONNECTIONS
TRACER WIRE CONTINUOUS
THHN 14 SOLID INSULATED COPPER
WIRE (BARE WIRE FROM BASE OF
VALVE TO END IN VALVE BOX)
CONCRETE VALVE SUPPORT
UNDISTURBED EARTH

SECTION

NOTES:

1. DRAWING PERTAINS TO ALL GATE VALVES SIZES 4" THRU 12".
2. IN UNPAVED AREAS, INSTALL 2' x 2' x 6" CONCRETE VALVE PAD FLUSH WITH TOP OF VALVE BOX, REINFORCE WITH #3 BARS AT 6" OCEW.
3. INSTALL TRACER WIRE WITH CABLE TIES MAXIMUM 50 FEET SPACING BETWEEN TIES.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER VALVE ASSEMBLY


7'
5'
7'
5'
PLAN VIEW
INSTALL BLOW OFF VALVE MARKER ON PIPE RAIL FENCE WITH STAINLESS STEEL U-BOLTS, WASHERS, AND NUTS
ORIENT BLOW OFF IN DIRECTION REQUIRED BY CITY OF LONGVIEW
3" DIAMETER SCH 20 STEEL PIPE RAIL FENCE PRIME AND PAINT COLOR AS REQUIRED BY THE CITY OF LONGVIEW
BLIND FLANGE
6" DIA 90° ELBOW, FL
6" DI PIPE
6" DIA MJ GATE VALVE WITH VALVE BOX (SEE TYPICAL VALVE, VALVE BOX, AND EXTENSION STEM DETAIL)
VARIES
DIMJ TEE (SIZE AS REQUIRED) WITH 6" BRANCH
6" DI PIPE (LENGTH AS REQUIRED) INSTALL SS ANCHOR RODS AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
MEGALUGS (TYP ALL BELOW GRADE BENDS AND VALVES)
6" DIA 45° DIMJ BEND
6" DIA MJ/FL 90° ELBOW
INSTALL ANCHOR COUPLING OR SS ANCHOR RODS AS APPROVED BY THE CITY OF LONGVIEW
THRUST BLOCKING (TYP ALL BELOW GRADE BENDS AND VALVES)

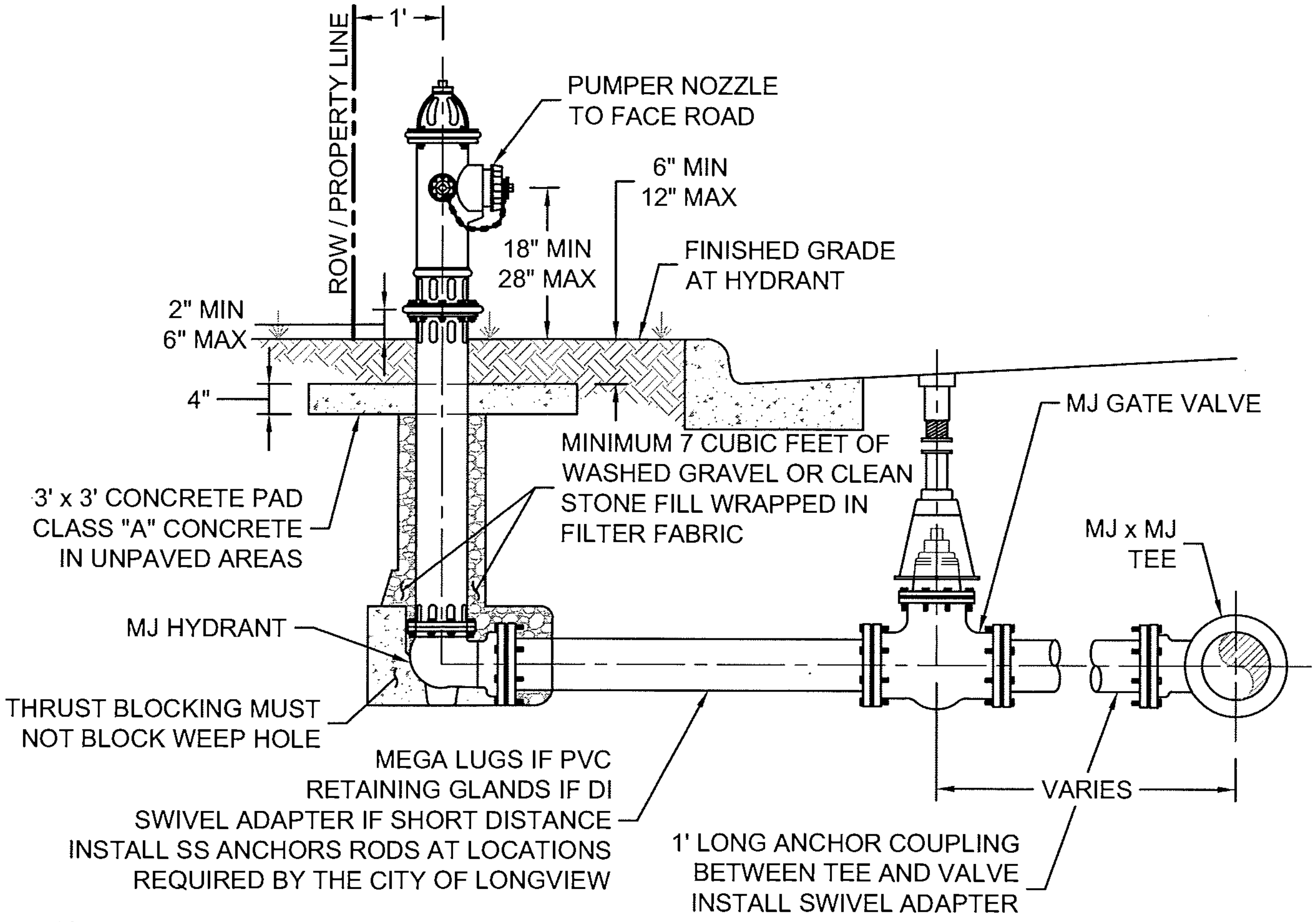
7' x 7' x 4" CONCRETE PAD (3,000 PSI CONCRETE REINFORCED WITH #3 @ 18" OCEW)
SLOPE PAD 1/2"/FT IN ALL DIRECTIONS FROM HIGH POINT AT CENTER OF PAD
SUBGRADE BELOW CONCRETE SHALL BE COMPACTED TO 95% OF STANDARD PROCTOR WITHIN ±2% OF OPTIMAL MOISTURE

NOTES:

1. PAINT ALL POSTS AND BRACES FIRST COAT: TNEMEC SERIES 27 - 2 - 3 dFT MILS SECOND COAT: TNEMEC SERIES 1074/1075 - 3 - 5 dFT MILS

2. PIPE BLOW OFF TO LOCATION AS REQUIRED BY CITY OF LONGVIEW.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	BLOW OFF ASSEMBLY


ROW / PROPERTY LINE
1'
PUMPER NOZZLE TO FACE ROAD
6" MIN
12" MAX
18" MIN
28" MAX
FINISHED GRADE AT HYDRANT
2" MIN
6" MAX
4"
MJ GATE VALVE
MINIMUM 7 CUBIC FEET OF WASHED GRAVEL OR CLEAN STONE FILL WRAPPED IN FILTER FABRIC
3' x 3' CONCRETE PAD CLASS "A" CONCRETE IN UNPAVED AREAS
MJ x MJ TEE
MJ HYDRANT
THRUST BLOCKING MUST NOT BLOCK WEEP HOLE
MEGA LUGS IF PVC
RETAINING GLANDS IF DI
SWIVEL ADAPTER IF SHORT DISTANCE
INSTALL SS ANCHORS RODS AT LOCATIONS REQUIRED BY THE CITY OF LONGVIEW
VARIES
1' LONG ANCHOR COUPLING BETWEEN TEE AND VALVE
INSTALL SWIVEL ADAPTER IF REQUIRED

NOTES:

1. CITY OF LONGVIEW ACCEPTABLE FIRE HYDRANTS ASSEMBLIES AREA AS FOLLOWS: MUELLER A-423, AMERICAN DARLING B84 Btc, OR CLOW-MEDALLION.

2. ALL FIRE HYDRANTS SHALL CONFORM TO AWWA STANDARD SPECIFICATIONS FOR FIRE HYDRANTS FOR ORDINARY WATER WORKS SERVICE, C-502.

3. TYPICAL VALVE: ACTUAL VALVE LOCATION WILL DEPEND ON LOCATION OF WATER MAIN.

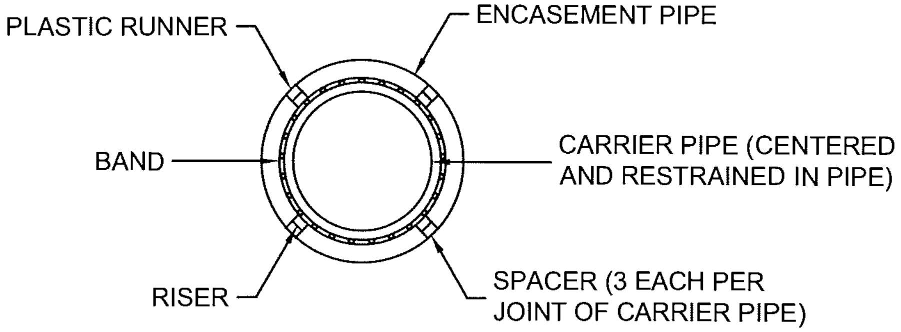
4. STANDARD BURY DEPTH 4' FEET.

5. SET FIRE HYDRANT ON THE LOT LINE EXTENDED WHEN POSSIBLE.

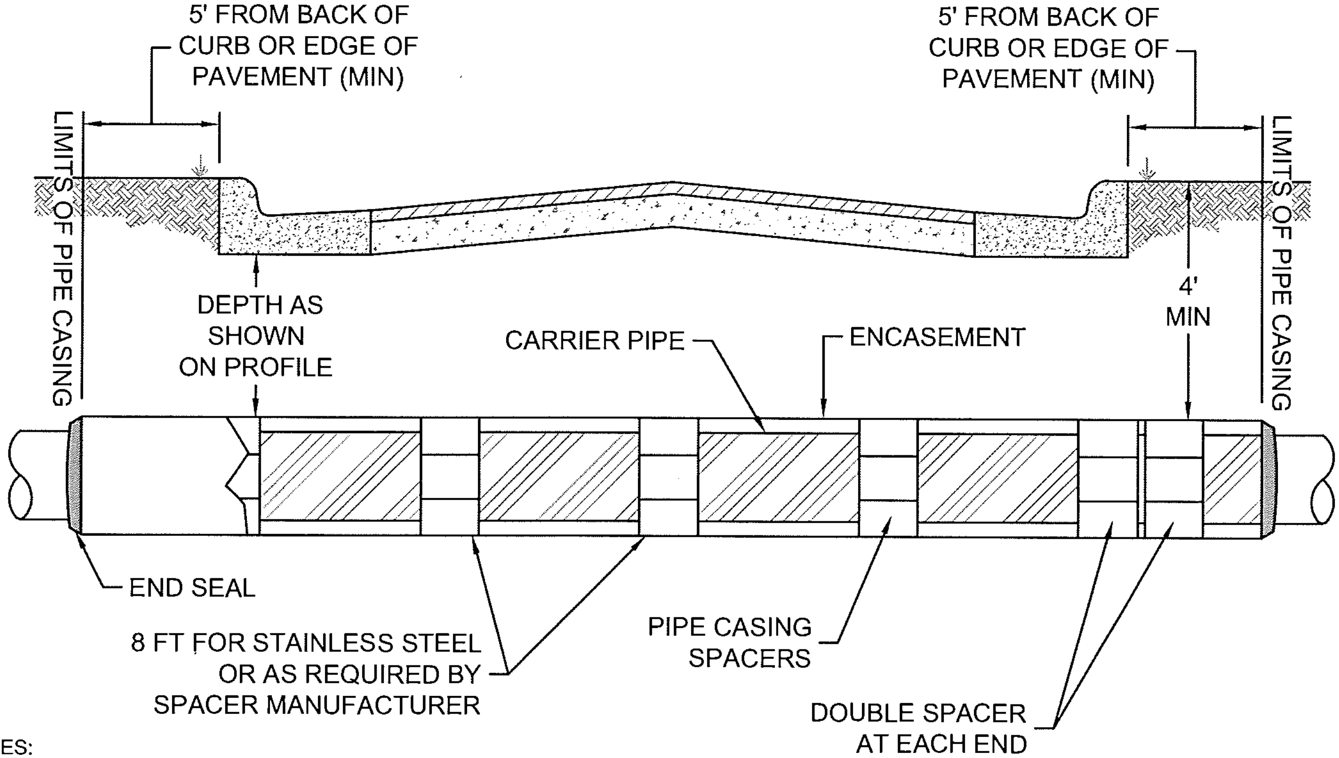
6. FIRE HYDRANTS SHALL BE YELLOW IN COLOR.

7. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	FIRE HYDRANT ASSEMBLY


PLASTIC RUNNER
ENCASEMENT PIPE
BAND
CARRIER PIPE (CENTERED AND RESTRAINED IN PIPE)
RISER
SPACER (3 EACH PER JOINT OF CARRIER PIPE)

PIPE CASING SPACER


5' FROM BACK OF CURB OR EDGE OF PAVEMENT (MIN)
5' FROM BACK OF CURB OR EDGE OF PAVEMENT (MIN)
LIMITS OF PIPE CASING
LIMITS OF PIPE CASING
DEPTH AS SHOWN ON PROFILE
4' MIN
CARRIER PIPE
ENCASEMENT
END SEAL
8 FT FOR STAINLESS STEEL OR AS REQUIRED BY SPACER MANUFACTURER
PIPE CASING SPACERS
DOUBLE SPACER AT EACH END

NOTES:

1. FOR ADDITIONAL INFORMATION, REFER TO PIPE CASING DETAIL NOTES AND SPECIFICATIONS.
2. CASING SPACERS SHALL BE STAINLESS STEEL.
3. CASING SPACERS SHALL CENTER AND RESTRAIN CARRIER PIPE IN CASING.
4. CASING END SEALS SHALL BE "PULLON" TYPE, "WRAP AROUND" END SEALS ARE PROHIBITED.
5. FOR NEW ROAD CONSTRUCTION, INSTALL CASING BY OPEN CUT PRIOR TO ROAD CONSTRUCTION. INSTALL CLASS C PIPE EMBEDMENT AND BACKFILL CASING TRENCH PER CLASS C EMBEDMENT DETAIL.
6. FOR CONSTRUCTION AT EXISTING ROADS, INSTALL BE DRY BORE UNLESS APPROVED OTHERWISE BY THE CITY OF LONGVIEW.
7. LATERAL AND VERTICAL VARIATION IN THE FINAL POSITION OF THE PIPE CASING OR TUNNEL LINER FROM THE LINE AND GRADE ESTABLISHED BY THE CITY OF LONGVIEW SHALL BE ACCEPTABLE ONLY TO THE EXTENT THAT IT DOES NOT IMPACT THE LINE AND GRADE OF THE CARRIER PIPE. IF IN THE CITY OF LONGVIEW'S OPINION, THE COMPLETED INSTALLATION DOES NOT MEET THE INTENT OF THE DESIGN, THE WORK SHALL NOT BE CONSIDERED ACCEPTABLE AND SHALL BE REPLACED.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 1 OF 4

PIPE CASING DETAIL NOTES:

MATERIALS:

A. STEEL PIPE:

1. STEEL CASING PIPE SHALL HAVE A MINIMUM YIELD STRENGTH OF 35,000 PSI.
2. STEEL CASING PIPE TO BE INSTALLED WITH UNION PACIFIC RAILROAD RIGHT-OF-WAY SHALL BE COATED WITH COAL TAR EPOXY MEETING THE REQUIREMENTS OF CORP OF ENGINEERS SPECIFICATIONS C-200A. COAL TAR EPOXY SHALL BE INSTALLED IN TWO COATS FOR A TOTAL DFT OF 16 MILS. WELDED JOINTS SHALL BE FIELD COATED. ALL OTHER CASING INSTALLED OUTSIDE OF UNION PACIFIC RAILROAD RIGHT-OF-WAY MAY BE UNCOATED.
3. CASING SHALL MEET ASTM A-36, ASTM A-570, ASTM A-135, ASTM A-139, OR CITY OF LONGVIEW APPROVED EQUAL.
4. PIPE JOINTS SHALL BE WELDED IN ACCORDANCE WITH AWWA C-206.
5. UNLESS SPECIFIED OTHERWISE, THE MINIMUM WALL THICKNESS OF STEEL CASING PIPE SHALL BE AS FOLLOWS:

CASING DIAMETER	WALL THICKNESS
<12"	0.25"
13" - 18"	0.25"
19" - 22"	0.25"
23" - 28"	0.4375"
29" - 34"	0.50"
35" - 42"	0.5625"
43" - 48"	0.625"

B. CASING INSULATORS:

1. USE CASING INSULATORS FOR ALL TYPES OF CARRIER PIPE.
2. INSULATORS SHALL CONSIST OF PRE-MANUFACTURED STEEL BANDS WITH PLASTIC LINING AND PLASTIC RUNNERS.
3. INSULATORS SHALL FIT SNUG OVER THE CARRIER PIPE AND POSITION THE CARRIER PIPE APPROXIMATELY IN THE CENTER OF THE CASING PIPE, TO PROVIDE ADEQUATE CLEARANCE BETWEEN THE CARRIER PIPE BELL AND THE CASING PIPE.
4. FASTENERS FOR INSULATORS SHALL BE STAINLESS STEEL.
5. INSULATORS SHALL BE AS MANUFACTURED BY ADVANCE PRODUCT AND SYSTEMS, INC., MODEL #SSI, OR CITY OF LONGVIEW APPROVED EQUAL.

C. END SEALS:

1. ALL CASINGS SHALL BE SEALED.
2. SEALS SHALL BE ONE-PIECE RUBBER WITH STAINLESS STEEL BANDS.
3. END SEALS SHALL BE MOLDED TO FIX THE CASING PIPE AND CARRIER PIPE.
4. ADVANCED PRODUCT AND SYSTEMS, MODEL #AC OR CITY OF LONGVIEW APPROVED EQUAL.

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CROSSINGS INSTALLED BY BORING NOTES:

A. PERFORM THE BORING FROM THE LOW OR DOWNSTREAM END UNLESS SPECIFIED OTHERWISE.

1. THE CASING BORE SHALL BE DONE BY AUGER TYPE BORING METHOD. THE CASING BORE SHALL NOT BE DONE BY DIRECTIONAL DRILLING UNLESS APPROVED BY THE CITY OF LONGVIEW PRIOR TO BIDDING.

2. PLACE EXCAVATED MATERIAL NEAR THE TOP OF THE WORKING PIT AND DISPOSE OF MATERIAL AS REQUIRED.

3. JETTING SHALL NOT BE PERMITTED.

B. IN UNCONSOLIDATED SOIL FORMATIONS, A GEL-FORMING COLLOIDAL DRILLING FLUID CONSISTING OF AT LEAST 10% OF HIGH GRADE CAREFULLY PROCESSED BENTONITE MAY BE USED TO CONSOLIDATE CUTTING OF THE BIT, SEAL THE WALLS OF THE HOLE, AND FURNISH LUBRICATION FOR SUBSEQUENT REMOVAL OF CUTTING AND INSTALLATION OF THE PIPE IMMEDIATELY THEREAFTER.

C. IN LOCATIONS WHERE THE SOIL FORMATION IS OTHER THAN CONSOLIDATED ROCK, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION.

1. THIS REQUIREMENT APPLIES TO ALL BORED HOLES OF 18" OR GREATER IN DIAMETER.

2. FOR SMALLER DIAMETER BORED HOLES, IT IS DESIRABLE THAT THE CASING BE INSTALLED AS THE BORING PROGRESSES, BUT BECAUSE OF DIFFERENCES IN SOIL FORMATIONS, THE TIME FOR INSERTING THE CASING SHALL BE THE CONTRACTOR'S RESPONSIBILITY.

3. IN THE EVENT THAT CAVING SAND OR WATER BEARING MATERIALS ARE ENCOUNTERED, INSERT THE CASING PIPE SIMULTANEOUSLY WITH THE BORING OPERATION REGARDLESS OF THE DIAMETER OF THE BORED HOLE.

4. IN ALL CASES, THE SECURITY AND INTEGRITY OF THE ROADWAY IS THE PRIMARY CONCERN.

5. THE CONTRACTOR SHALL BE HELD FULLY RESPONSIBLE FOR CONTINUED INTEGRITY OF THE STRUCTURE OF THE ROADWAY BEING CROSSED, WHETHER OR NOT A CASING PIPE IS INSERTED SIMULTANEOUSLY WITH THE BORING OPERATION.

CROSSING INSTALLED BY TUNNELING AND JACKING:

A. JACK THE PIPE FROM THE LOW OR DOWNSTREAM END, UNLESS SPECIFIED OTHERWISE.

1. PROVIDE HEAVY-DUTY JACKS SUITABLE FOR FORCING THE PIPE THROUGH THE EMBANKMENT.

2. IN OPERATING JACKS, APPLY EVEN PRESSURE TO THE JACKS USED.

3. PROVIDE A SUITABLE JACKING HEAD AND BRACING BETWEEN JACKS SO THAT PRESSURE WILL BE APPLIED AT THE PIPE IN UNIFORMLY AROUND THE RIND OF THE PIPE.

4. PROVIDE A SUITABLE JACKING FRAME OR BACKSTOP.

5. SET THE PIPE TO BE JACKED ON GUIDES, PROPERLY BRACED TOGETHER, TO SUPPORT THE SECTION OF THE PIPE AND TO DIRECT IT IN THE PROPER LINE AND GRADE.

6. PLACE THE WHOLE JACKING ASSEMBLY SO AS TO LINE UP WITH THE DIRECTION AND GRADE OF THE PIPE.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	PIPE CASING PAGE 3 OF 4

    7. IN GENERAL, EXCAVATE EMBANKMENT MATERIAL JUST AHEAD OF THE PIPE AND MATERIAL REMOVED THROUGH THE PIPE.

    8. FORCE THE PIPE THROUGH THE EMBANKMENT WITH JACKS INTO THE SPACE PROVIDED.

B. THE EXCAVATION FOR THE UNDERSIDE OF THE PIPE, FOR AL LEAST 1/3 OF THE CIRCUMFERENCE OF THE PIPE, SHALL CONFORM TO THE CONTOUR AND GRADE OF THE PIPE.

    1. PROVIDE A CLEARANCE OF NOT MORE THAN 2" FOR THE UPPER HALF OF THE PIPE.

    2. THIS CLEARANCE SHALL BE TAPERED OFF TO ZERO AT THE POINT WHERE EXCAVATION CONFORMS TO THE CONTOUR OF THE PIPE.

    3. EXTEND THE DISTANCE OF THE EXCAVATION BEYOND THE END OF THE PIPE DEPENDING ON THE CHARACTER OF THE MATERIAL, BUT DO NOT EXCEED 2' IN ANY CASE.

    4. DECREASE THE DISTANCE IF THE CHARACTER OF THE MATERIAL BEING EXCAVATED MAKES IT DESIRABLE TO KEEP THE ADVANCE EXCAVATION CLOSER TO THE END OF THE PIPE.

C. IF DESIRED, USE A CUTTING EDGE OF STEEL PLATE AROUND THE HEAD END OF THE PIPE EXTENDING A SHORT DISTANCE BEYOND THE END OF THE PIPE WITH INSIDE ANGLES OR LUGS TO KEEP CUTTING EDGE FROM SLIPPING BACK ONTO PIPE.

D. WHEN JACKING OF PIPE HAS BEGUN, CARRY ON THE OPERATION WITHOUT INTERRUPTION TO PREVENT THE PIPE FROM BECOMING FIRMLY SET IN THE EMBANKMENT.

    1. REMOVE AND REPLACE ANY PIPE DAMAGED IN THE JACKING OPERATIONS.

    2. THE CONTRACTOR SHALL ABSORB THE ENTIRE EXPENSE.

CROSSING WITH CASING INSTALLED BY OPEN CUT:

A. THIS ARTICLE COVERS THE REQUIREMENTS FOR THE CONSTRUCTION OF CROSSING WHERE PIPE CASING IS REQUIRED FOR INSTALLATION BY THE OPEN CUT METHOD.

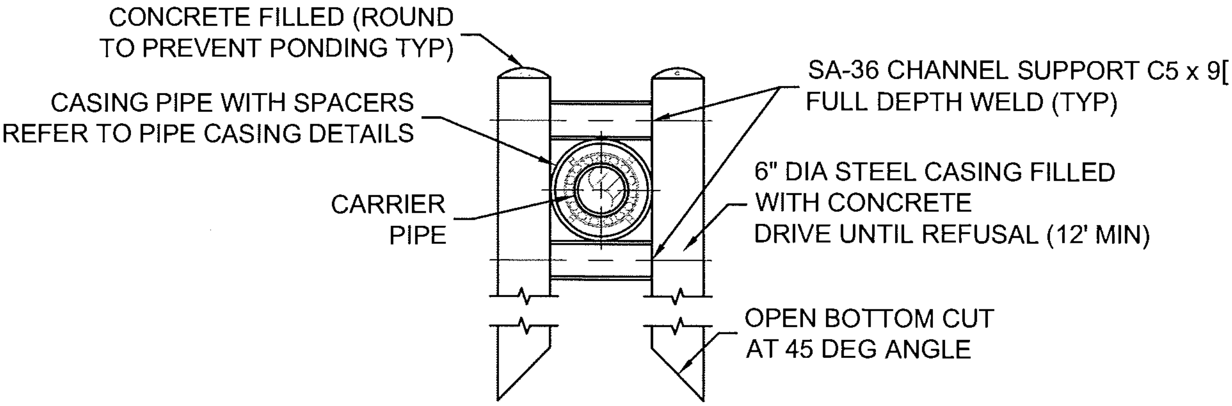
B. EXCAVATION, BACKFILL, AND EMBANKMENT OF CASING PIPE SHALL BE AS SPECIFIED.

C. CASING SHALL BE BEDDED IN GRAVEL MATERIAL TO THE SPRINGLINE OF THE CASING.

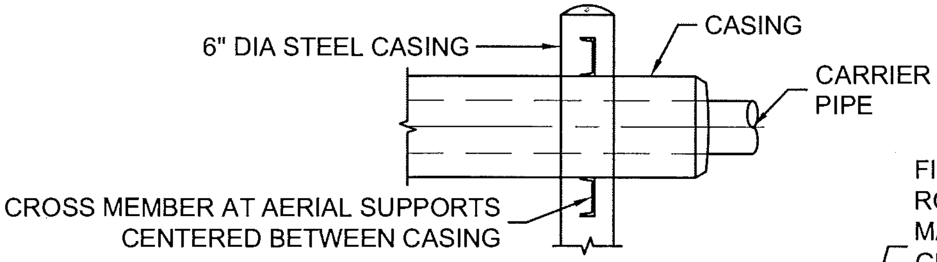
D. CONTRACTOR SHALL BACKFILL WITH SELECT FILL MATERIAL COMPACTED IN 8-INCH LIFTS.

E. CONTRACTOR SHALL COMPLETE THE BACKFILL AND REPAIR THE PAVEMENT SECTION AS SHOWN.

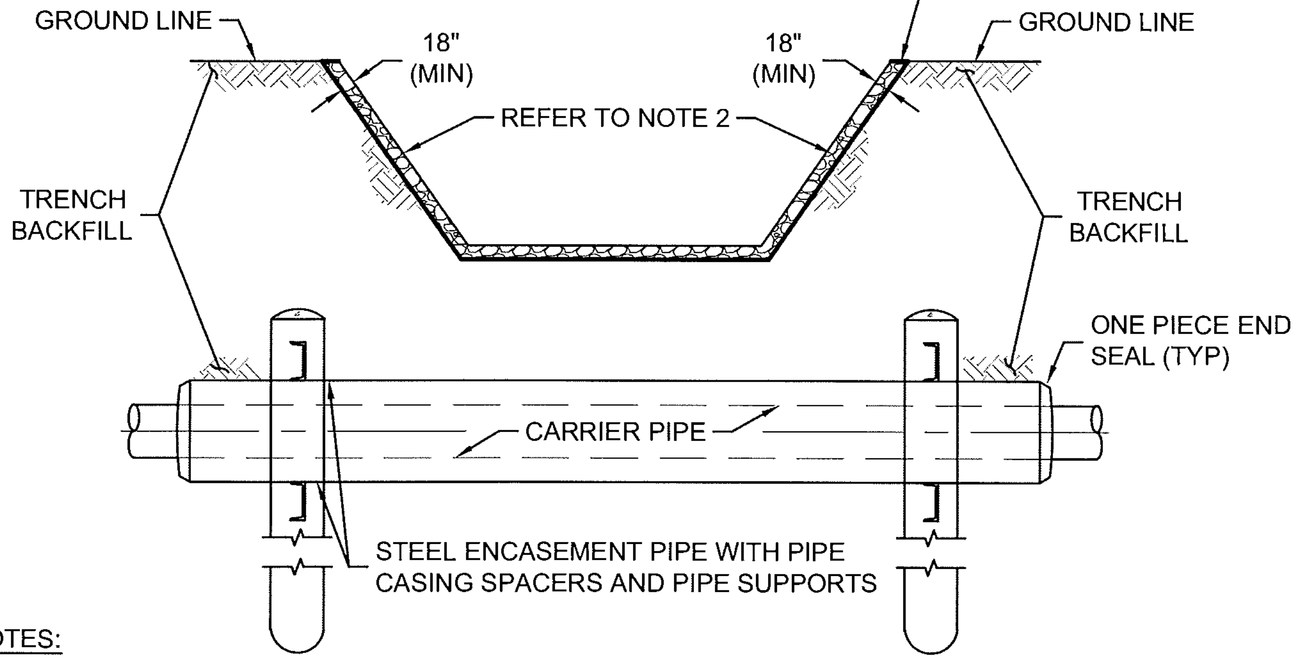
F. IF SETTLEMENT OCCURS, THE PAVEMENTS SHALL BE REMOVED AND THE TRENCH RECOMPACTED AS THE CONTRACTOR'S EXPENSE.


CONCRETE FILLED (ROUND TO PREVENT PONDING TYP)
CASING PIPE WITH SPACERS REFER TO PIPE CASING DETAILS
CARRIER PIPE
SA-36 CHANNEL SUPPORT C5 x 9[FULL DEPTH WELD (TYP)
6" DIA STEEL CASING FILLED WITH CONCRETE DRIVE UNTIL REFUSAL (12' MIN)
OPEN BOTTOM CUT AT 45 DEG ANGLE

PIPE SUPPORT


6" DIA STEEL CASING
CASING
CARRIER PIPE
CROSS MEMBER AT AERIAL SUPPORTS CENTERED BETWEEN CASING

SIDE VIEW PIPE SUPPORT


FINISHED SURFACE OF ROCK RIPRAP SHALL MATCH LEVELS AND GRADES OF PRECONSTRUCTION CONTOURS
GROUND LINE
18" (MIN)
18" (MIN)
GROUND LINE
REFER TO NOTE 2
TRENCH BACKFILL
TRENCH BACKFILL
ONE PIECE END SEAL (TYP)
CARRIER PIPE
STEEL ENCASEMENT PIPE WITH PIPE CASING SPACERS AND PIPE SUPPORTS

NOTES:

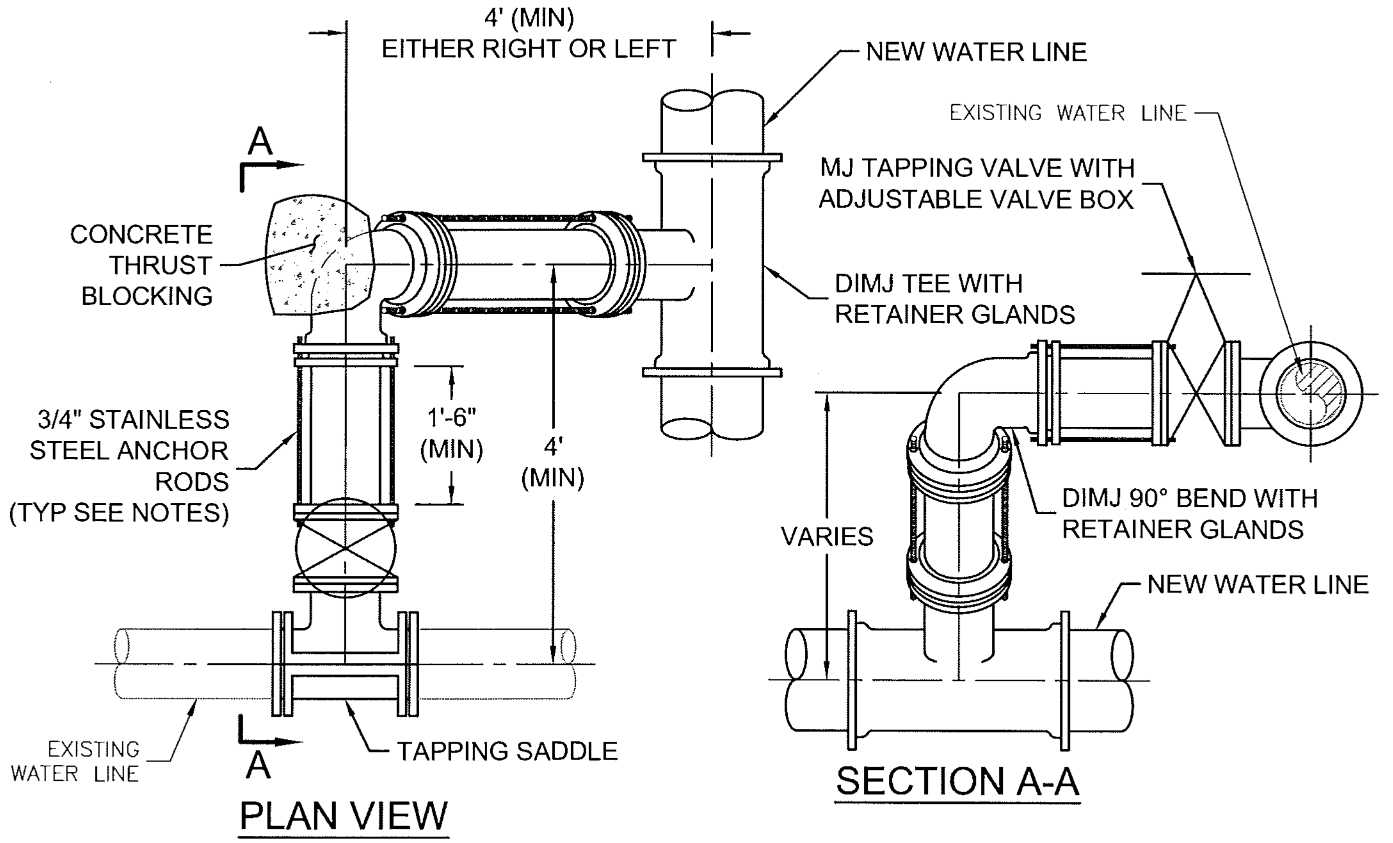
1. REFER TO PIPE CASING DETAILS FOR CASING SIZE/MATERIAL, SPACERS, AND END SEALS.
2. INSTALL MIRAFI 700X FILTER FABRIC, OR EQUIVALENT UNDER AND ON SIDES OF PROPOSED STONES. SECURE WITH 9" LONG U-PINS @ 4' OCEW.
3. ROCK RIPRAP - TxDOT ITEM 432, TYPE R MODIFIED TO HAVE ALL STONES BETWEEN 50 AND 150 LBS, AND AT LEAST 50% OF THE STONES GREATER THAN 100 LBS.
4. INSTALL RIPRAP TO OUTSIDE OF TRENCH WIDTH PLUS 3' EITHER SIDE OF TRENCH EXCAVATION.

WATER

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

WATERLINE CREEK
CROSSING


4' (MIN)
EITHER RIGHT OR LEFT
NEW WATER LINE
EXISTING WATER LINE
MJ TAPPING VALVE WITH ADJUSTABLE VALVE BOX
A
CONCRETE THRUST BLOCKING
DIMJ TEE WITH RETAINER GLANDS
3/4" STAINLESS STEEL ANCHOR RODS (TYP SEE NOTES)
1'-6" (MIN)
4' (MIN)
DIMJ 90° BEND WITH RETAINER GLANDS
VARIES
NEW WATER LINE
EXISTING WATER LINE
A
TAPPING SADDLE
SECTION A-A
PLAN VIEW

PIPE SIZE	6	8	12	16	18
RODS PER NIPPLE	2	2	4	6	6

NOTES:

1. LOCATE EXISTING WATER LINE IN ADVANCE OF LAYING PROPOSED WATER LINE IN ORDER TO ASSURE ADEQUATE LENGTH TO ADJUST DEPTH OF NEW LINE.
2. DIMENSIONS SHOWN ARE RECOMMENDED MINIMUMS TO PROVIDE ADEQUATE ROOM FOR TIGHTENING BOLTS ON JOINTS. OTHER DIMENSIONS MAY BE USED.
3. PROVIDE 3/4" STAINLESS STEEL ALL THREAD TIE RODS FOR ANCHORING ALL JOINTS.
4. RODS SHALL BE CUT IN FIELD TO FIT.
5. ROTATE TEE UP AND ELBOW DOWN AS REQUIRED TO MATCH.
6. ANCHOR COUPLINGS MAY BE SUBSTITUTED FOR SPOOL PIPES AND THRUST RODS.
7. TAPPING SADDLE AND VALVE SHALL MEET CITY OF LONGVIEW REQUIREMENTS. TAPPING VALVE SHALL INCLUDE BOX, CONCRETE PAD, BLOCKING, AND APPURTENANCES AS SHOWN ON THE WATER VALVE ASSEMBLY DETAIL.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE SWING CONNECTION

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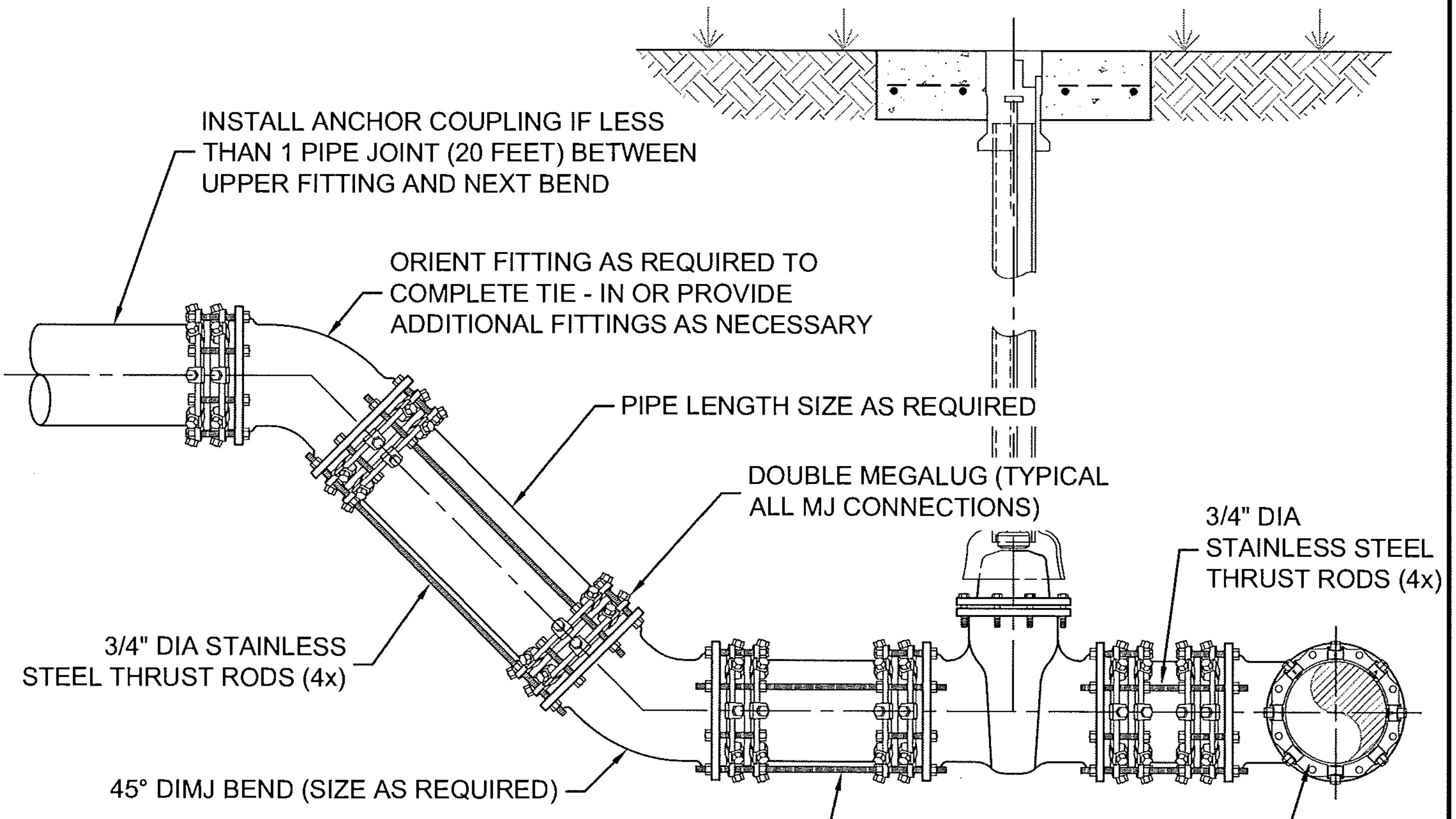

INSTALL ANCHOR COUPLING IF LESS THAN 1 PIPE JOINT (20 FEET) BETWEEN UPPER FITTING AND NEXT BEND
ORIENT FITTING AS REQUIRED TO COMPLETE TIE - IN OR PROVIDE ADDITIONAL FITTINGS AS NECESSARY
PIPE LENGTH SIZE AS REQUIRED
DOUBLE MEGALUG (TYPICAL ALL MJ CONNECTIONS)
3/4" DIA STAINLESS STEEL THRUST RODS (4x)
3/4" DIA STAINLESS STEEL THRUST RODS (4x)
45° DIMJ BEND (SIZE AS REQUIRED)
3/4" DIA STAINLESS STEEL THRUST RODS (4x)
DIMJ TEE (SIZE AS REQUIRED)

NOTES:

1. TIE - IN DETAIL WITH DOUBLE MEGALUGS AND ANCHOR RODS REQUIRED AT LOCATIONS WHEN WATER LINE MUST BE PUT IN SERVICE BEFORE CONCRETE BLOCKING CAN REACH 28-DAY COMPRESSIVE STRENGTH.

2. THRUST BLOCKING OMITTED FOR CLARITY. INSTALL CONCRETE THRUST BLOCKING AT ALL VALVES AND FITTINGS.

3. LOCATE VALVE AS CLOSE TO TIE - IN AS POSSIBLE. TIE - IN USING SHORT SPOOL WITH ANCHOR RODS OR ANCHOR COUPLING BETWEEN MJ TEE AND VALVE.

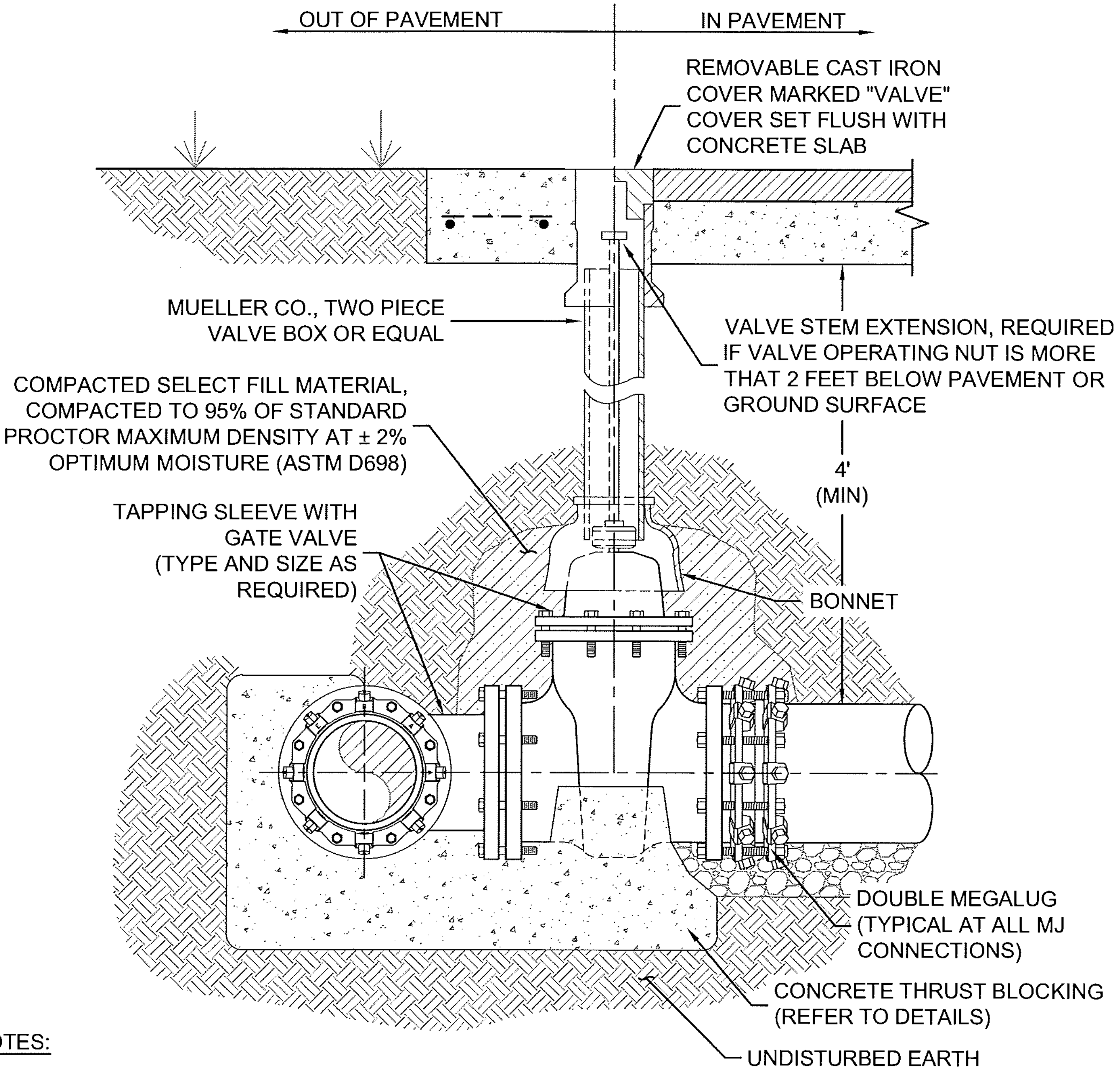
4. PVC PIPE CONNECTIONS SHALL HAVE DOUBLE MEGALUGS WITH ANCHOR RODS. DI PIPE SHALL HAVE RETAINING GLANDS WITH ANCHOR RODS.

5. INSTALL ANCHOR COLLAR AND ANCHOR RODS AT UPPER FITTING IF LESS THAN 1 PIPE JOINT (20 FEET) BETWEEN UPPER FITTING AND NEXT BEND ON LINE.

6. IF AREA UNDER UPPER FITTING IS OVER EXCAVATED, BACKFILL AND COMPACT WITH SELECT FILL TO 95% OF MAXIMUM DENSITY (ASTM D698) WITHIN 2% OF OPTIMUM MOISTURE OR AS DIRECTED BY THE CITY OF LONGVIEW.

7. INSTALL CLASS C EMBEDMENT UNLESS OTHERWISE DIRECTED BY THE CITY OF LONGVIEW.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATERLINE TIE - IN


OUT OF PAVEMENT
IN PAVEMENT
REMOVABLE CAST IRON COVER MARKED "VALVE" COVER SET FLUSH WITH CONCRETE SLAB
MUELLER CO., TWO PIECE VALVE BOX OR EQUAL
VALVE STEM EXTENSION, REQUIRED IF VALVE OPERATING NUT IS MORE THAT 2 FEET BELOW PAVEMENT OR GROUND SURFACE
COMPACTED SELECT FILL MATERIAL, COMPACTED TO 95% OF STANDARD PROCTOR MAXIMUM DENSITY AT ± 2% OPTIMUM MOISTURE (ASTM D698)
4' (MIN)
TAPPING SLEEVE WITH GATE VALVE (TYPE AND SIZE AS REQUIRED)
BONNET
DOUBLE MEGALUG (TYPICAL AT ALL MJ CONNECTIONS)
CONCRETE THRUST BLOCKING (REFER TO DETAILS)
UNDISTURBED EARTH

NOTES:

1. DRAWING PERTAINS TO ALL GATE VALVES SIZES 4" THRU 12".
2. IN UNPAVED AREAS, INSTALL 2' x 2' x 6" CONCRETE VALVE PAD FLUSH WITH TOP OF VALVE BOX, REINFORCE WITH #3 BARS AT 6" OCEW.
3. TAPPING SLEEVES SHALL BE STAINLESS STEEL WITH STAINLESS STEEL NUTS AND BOLTS (SLEEVE MAY BE EPOXY COATED STAINLESS STEEL).
4. FULL DIAMETER DUCTILE IRON TAPPING SLEEVES MAY BE USED IN PLACE OF STAINLESS STEEL.
5. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

WATER

LATEST REVISION:
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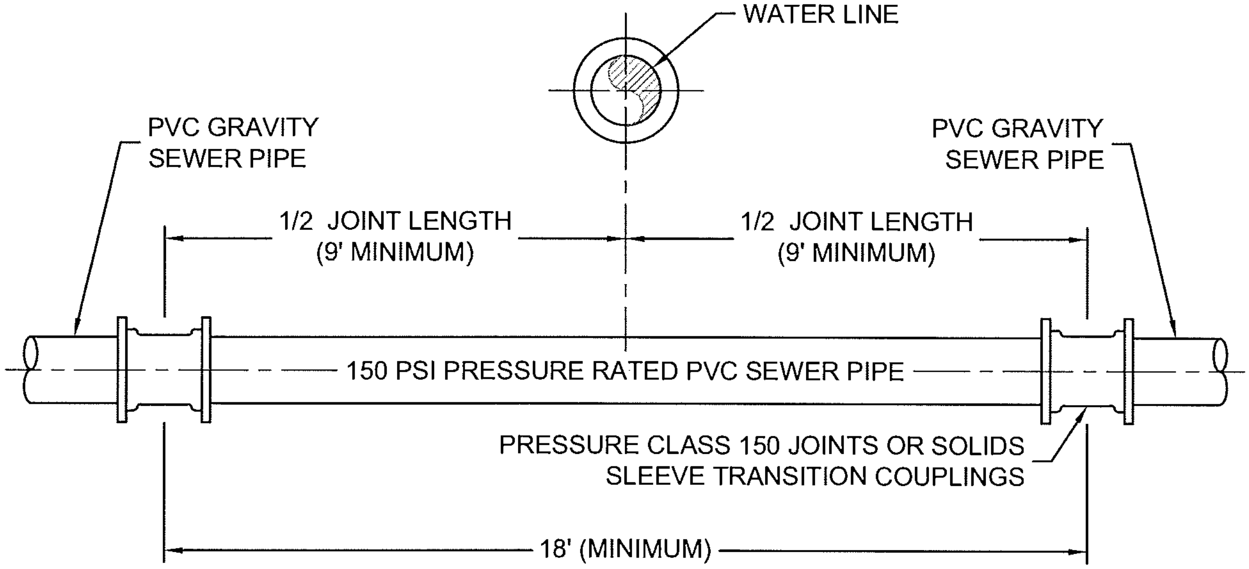
CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

WATERLINE TAPPING
SLEEVE AND VALVE


WATER LINE
PVC GRAVITY SEWER PIPE
PVC GRAVITY SEWER PIPE
1/2 JOINT LENGTH (9' MINIMUM)
1/2 JOINT LENGTH (9' MINIMUM)
150 PSI PRESSURE RATED PVC SEWER PIPE
PRESSURE CLASS 150 JOINTS OR SOLIDS SLEEVE TRANSITION COUPLINGS
18' (MINIMUM)

NOTES:

1. FOR NEW WATER/SEWER INSTALLATION, THE WATERLINE SHALL BE LOCATED ABOVE THE SEWER LINE.

2. CROSSING PIPES WITHIN 9 FEET, WHERE THE COLLECTION PIPE IS BELOW THE WATERLINE, CONSTRUCT THE COLLECTION LINE USING THE FOLLOWING:
   a. 150 PSI PRESSURE CLASS PIPE AT LEAST 18 FEET LONG WITH JOINT CENTERED ON THE CROSSING.
   b. AT LEAST 6" OF VERTICAL SEPARATION.
   c. TERMINATING JOINTS DESIGNED TO SEAL AT ATMOSPHERIC PRESSURE.

3. FOR NEW WATERLINE CROSSING EXISTING SEWER, REMOVE EXISTING SEWER LINE AND REPLACE WITH A FULL JOINT OF 150 PSI OR GREATER PRESSURE RATED PVC PIPE. CENTER JOINT AT WATERLINE CROSSING. INSTALL PRESSURE RATED TRANSITIONS.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER - SEWER CROSSING

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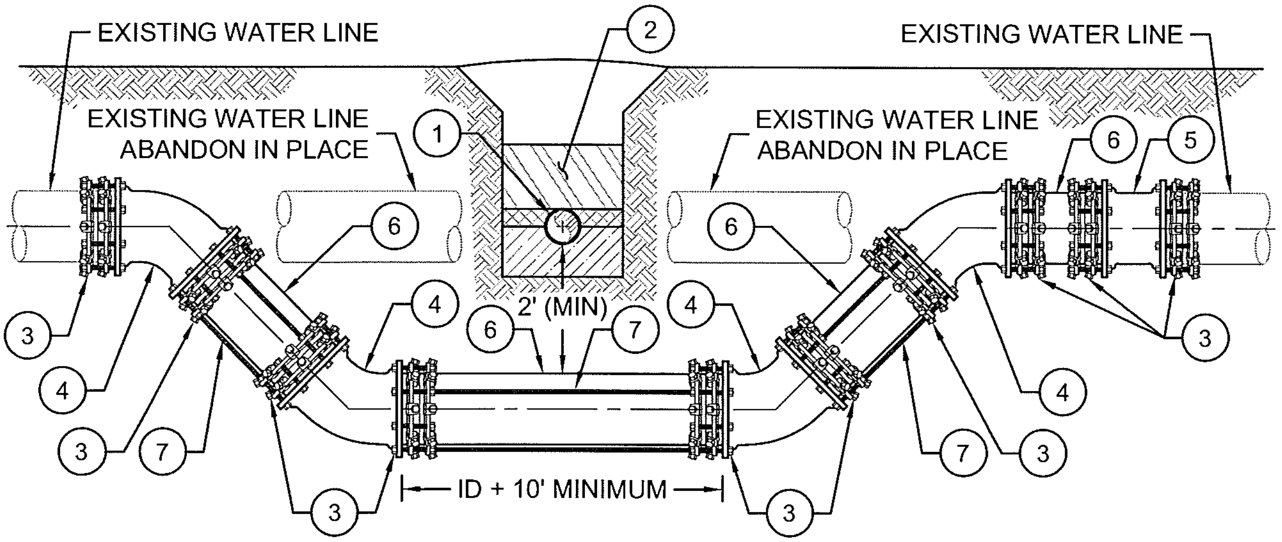

EXISTING WATER LINE
EXISTING WATER LINE
EXISTING WATER LINE ABANDON IN PLACE
EXISTING WATER LINE ABANDON IN PLACE
2' (MIN)
ID + 10' MINIMUM
1
2
3
4
5
6
7

MARK	DESCRIPTION
1	WASTEWATER LINE 20' STEEL CASING OR 20' DI CENTERED ON WATERLINE CROSSING
2	CLASS C EMBEDMENT OR AS DIRECTED BY THE CITY OF LONGVIEW
3	EBBA IRON DOUBLE MEGALUGS
4	45° DIMJ BEND WITH THRUST BLOCKING
5	DIMJ SOLID SLEEVE (SIZE AS REQUIRED)
6	DI PIPE (SIZE AND TYPE AS REQUIRED)
7	3/4" DIA STAINLESS STEEL THRUST RODS (4x)

NOTES:

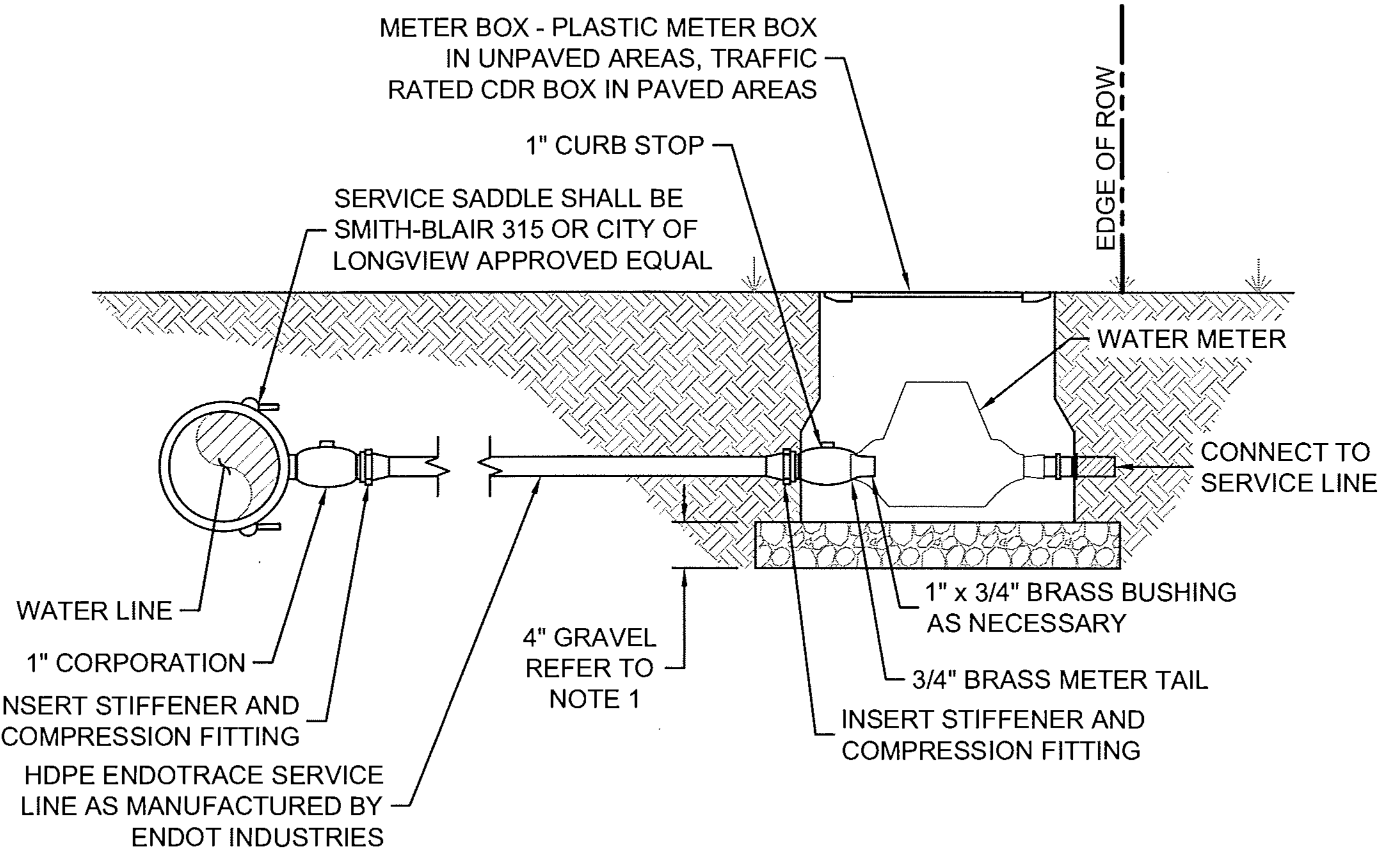
1. THRUST BLOCKING OMITTED FOR CLARITY. INSTALL CONCRETE THRUST BLOCKING AT ALL VALVES AND FITTINGS.
2. INSTALL FOUR 45° DIMJ BENDS (UNLESS OTHERWISE DIRECTED BY CITY OF LONGVIEW) AND LENGTH OF PIPE NECESSARY TO ACHIEVE MINIMUM CLEARANCE.
3. REPLACEMENT PIPE SHALL BE DI, ALL BENDS SHALL BE DIMJ WITH EBBA IRON DOUBLE MEGALUGS OR CITY OF LONGVIEW APPROVED EQUAL.
4. INSTALL ANCHOR COUPLING AND ANCHORS RODS AT UPPER FITTINGS IF LESS THE 1 PIPE JOINT (20 FEET) BETWEEN UPPER FITTING AND NEXT BEND.
5. PROVIDE 8 MIL POLY WRAP AROUND PIPE AND FITTINGS PRIOR TO INSTALLING CONCRETE ENCASEMENT.
6. FOR NEW SEWER LINE, INSTALL ONE SOLID, 20 FOOT JOINT OF DI PIPE IN SEWER LINE CENTERED ON WATERLINE CROSSING. USE PRESSURE RATED COUPLING AT TRANSITIONS FROM EXISTING PIPE TO DI PIPE.
7. FOR EXISTING SEWER LINE, REMOVE AND REPLACE SECTION OF EXISTING LINE WITH ONE SOLID, 20 FOOT JOINT OF DI PIPE IN SEWER LINE CENTERED ON WATERLINE CROSSING. USE PRESSURE RATED COUPLINGS AT TRANSITIONS FROM EXISTING PIPE TO DI PIPE.

WATER

LATEST REVISION:
3/20/2018

CITY OF LONGVIEW, TEXAS
STANDARD DETAILS

WATER - SEWER CROSSING
LOWERING WATERLINE


METER BOX - PLASTIC METER BOX IN UNPAVED AREAS, TRAFFIC RATED CDR BOX IN PAVED AREAS
EDGE OF ROW
1" CURB STOP
SERVICE SADDLE SHALL BE SMITH-BLAIR 315 OR CITY OF LONGVIEW APPROVED EQUAL
WATER METER
CONNECT TO SERVICE LINE
1" x 3/4" BRASS BUSHING AS NECESSARY
WATER LINE
1" CORPORATION
4" GRAVEL REFER TO NOTE 1
3/4" BRASS METER TAIL
INSERT STIFFENER AND COMPRESSION FITTING
INSERT STIFFENER AND COMPRESSION FITTING
HDPE ENDOTRACE SERVICE LINE AS MANUFACTURED BY ENDOT INDUSTRIES

NOTES:

1. 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. ROCK MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.

2. METER BOX - FROM CITY OF LONGVIEW APPROVED PRODUCT LIST: PLASTIC METER BOX SHALL BE INSTALLED OUTSIDE OF DRIVEWAYS, SIDEWALKS, OR PAVEMENT. METER BOXES LOCATED IN DRIVEWAYS, SIDEWALKS, OR PAVEMENT SHALL BE PRE-FAB FIBERCRETE BOX WITH COVER AS MANUFACTURED BY CDR (HUBBELL POWER SYSTEMS, INC.) A221118501050 WATER OR CITY OF LONGVIEW APPROVED EQUAL.

3. NEW METER FITTINGS SHALL HAVE FLARED CONNECTIONS.

4. ALL FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C-800. NO-LEAD BRASS SHALL CONTAIN NO MORE THAN ONE FIFTH (0.20% OR LESS) TOTAL LEAD CONTENT BY WEIGHT.

5. ALL MATERIALS, PIPE, TUBING, METER BOX, COVER, AND FITTINGS SHALL BE NEW.

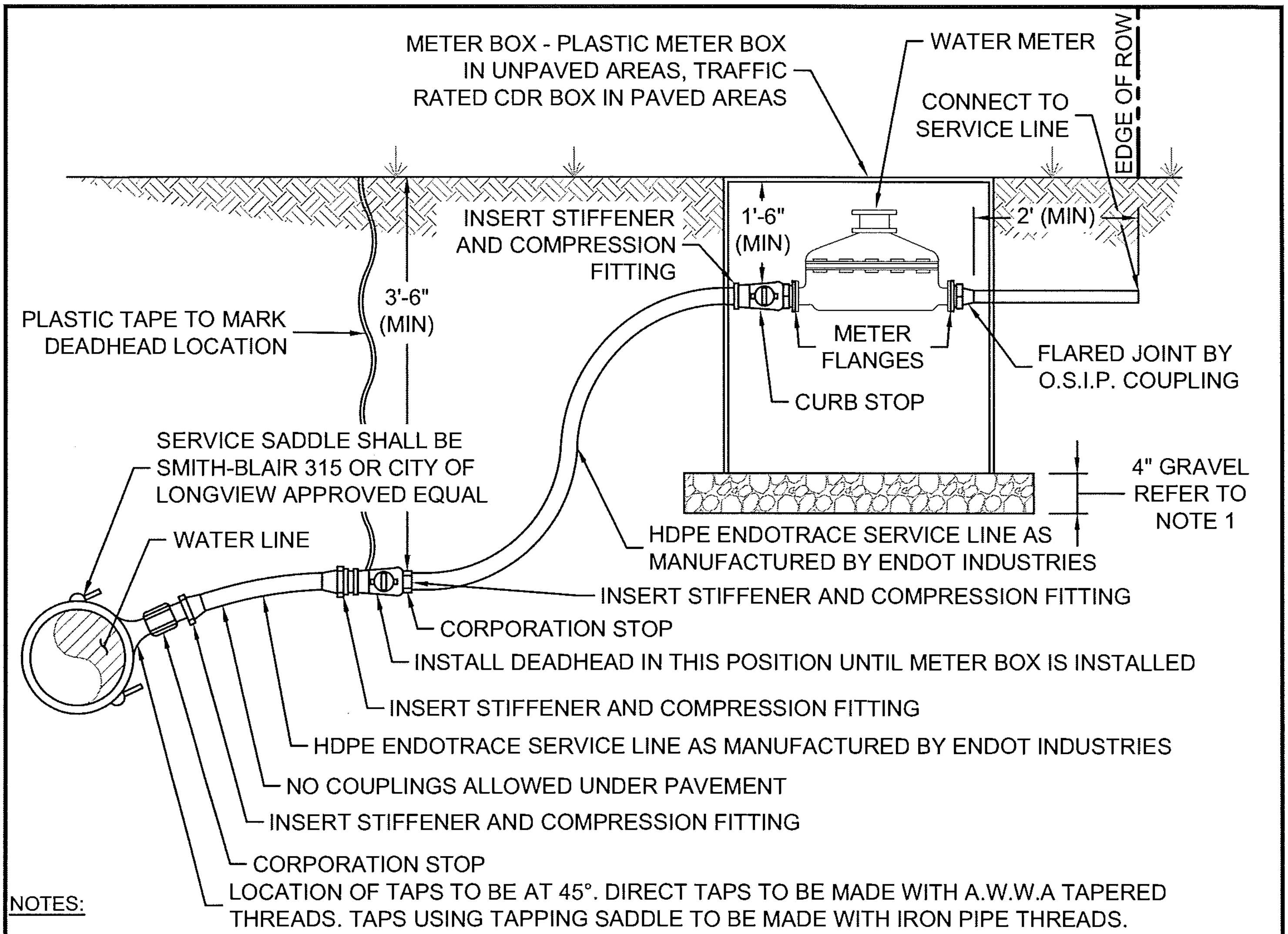
6. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

7. PERMIT REQUIRED FOR CONNECTION TO EXISTING WATERLINE.

8. WATERLINE TAP SHALL BE MADE BY THE CITY OF LONGVIEW OR APPROVED CONTRACTOR. TAP SHALL BE INSPECTED BY CITY OF LONGVIEW.

9. WATER METER SHALL BE SET BY THE CITY OF LONGVIEW. METER APPLICATION AND FEE REQUIRED. METER SET INSPECTION REQUIRED.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER SERVICE 1-IN


METER BOX - PLASTIC METER BOX IN UNPAVED AREAS, TRAFFIC RATED CDR BOX IN PAVED AREAS
WATER METER
EDGE OF ROW
CONNECT TO SERVICE LINE
2' (MIN)
1'-6" (MIN)
INSERT STIFFENER AND COMPRESSION FITTING
3'-6" (MIN)
PLASTIC TAPE TO MARK DEADHEAD LOCATION
METER FLANGES
FLARED JOINT BY O.S.I.P. COUPLING
CURB STOP
SERVICE SADDLE SHALL BE SMITH-BLAIR 315 OR CITY OF LONGVIEW APPROVED EQUAL
4" GRAVEL REFER TO NOTE 1
WATER LINE
HDPE ENDOTRACE SERVICE LINE AS MANUFACTURED BY ENDOT INDUSTRIES
INSERT STIFFENER AND COMPRESSION FITTING
CORPORATION STOP
INSTALL DEADHEAD IN THIS POSITION UNTIL METER BOX IS INSTALLED
INSERT STIFFENER AND COMPRESSION FITTING
HDPE ENDOTRACE SERVICE LINE AS MANUFACTURED BY ENDOT INDUSTRIES
NO COUPLINGS ALLOWED UNDER PAVEMENT
INSERT STIFFENER AND COMPRESSION FITTING
CORPORATION STOP
LOCATION OF TAPS TO BE AT 45°. DIRECT TAPS TO BE MADE WITH A.W.W.A TAPERED THREADS. TAPS USING TAPPING SADDLE TO BE MADE WITH IRON PIPE THREADS.

NOTES:

1. 3/4" TO 1" CRUSHED ROCK OR NATURAL STONE MEETING THE REQUIREMENTS OF ATM C-33 No. 57. ROCK MATERIAL SHALL BE CLEAN, WASHED, SOUND, DURABLE, AND WELL GRADED.

2. METER BOX - FROM CITY OF LONGVIEW APPROVED PRODUCT LIST: PLASTIC METER BOX SHALL BE INSTALLED OUTSIDE OF DRIVEWAYS, SIDEWALKS, OR PAVEMENT. METER BOXES LOCATED IN DRIVEWAYS, SIDEWALKS, OR PAVEMENT SHALL BE PRE-FAB FIBERCRETE BOX WITH COVER AS MANUFACTURED BY CDR (HUBBELL POWER SYSTEMS, INC.) A221118501050 WATER OR CITY OF LONGVIEW APPROVED EQUAL.

3. NEW METER FITTINGS SHALL HAVE FLARED CONNECTIONS.

4. ALL FITTINGS SHALL BE IN ACCORDANCE WITH AWWA C-800. NO-LEAD BRASS SHALL CONTAIN NO MORE THAN ONE FIFTH (0.20% OR LESS) TOTAL LEAD CONTENT BY WEIGHT.

5. ALL MATERIALS, PIPE, TUBING, METER BOX, COVER, AND FITTINGS SHALL BE NEW.

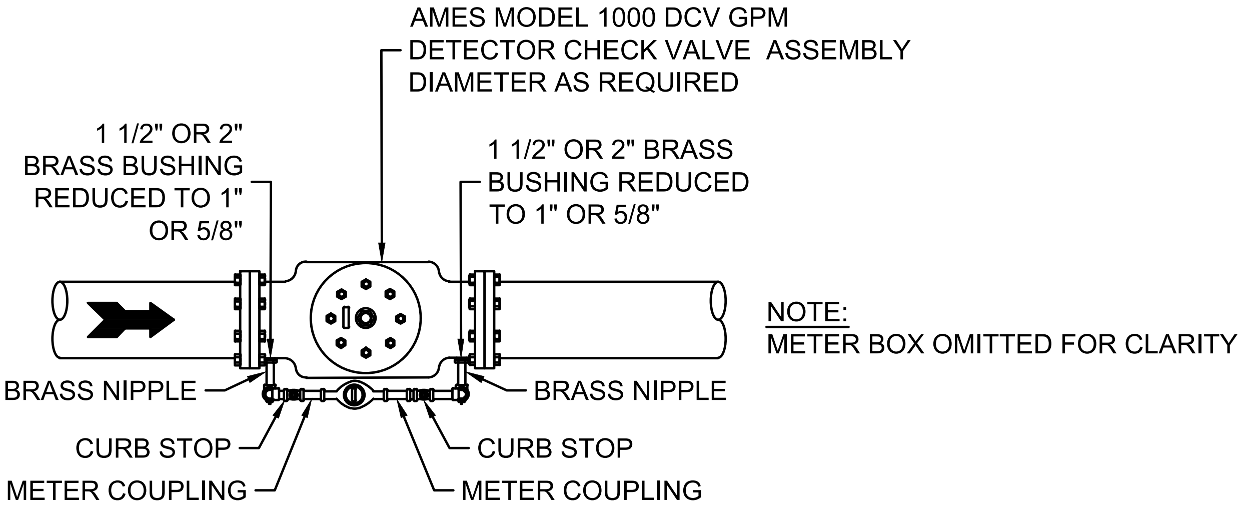
6. ALL MATERIALS SHALL BE AS LISTED ON THE CITY OF LONGVIEW APPROVED PRODUCTS LIST - LATEST VERSION.

7. PERMIT REQUIRED FOR CONNECTION TO EXISTING WATERLINE.

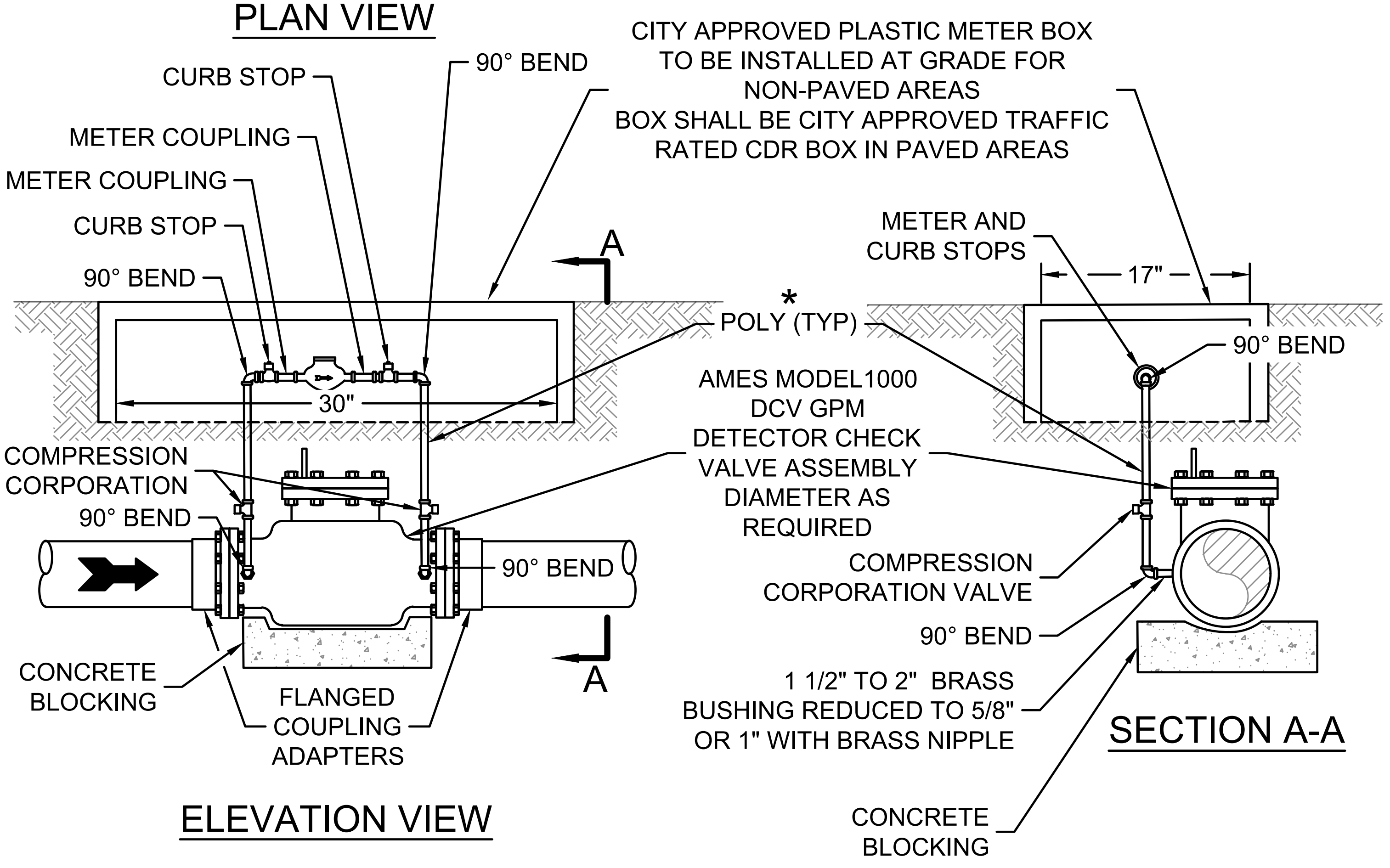
8. WATERLINE TAP SHALL BE MADE BY THE CITY OF LONGVIEW OR APPROVED CONTRACTOR. TAP SHALL BE INSPECTED BY CITY OF LONGVIEW.

9. WATER METER SHALL BE SET BY THE CITY OF LONGVIEW. METER APPLICATION AND FEE REQUIRED. METER SET INSPECTION REQUIRED.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	WATER SERVICE 1.5-IN OR 2-IN


AMES MODEL 1000 DCV GPM
DETECTOR CHECK VALVE ASSEMBLY
DIAMETER AS REQUIRED
1 1/2" OR 2"
BRASS BUSHING
REDUCED TO 1"
OR 5/8"
1 1/2" OR 2" BRASS
BUSHING REDUCED
TO 1" OR 5/8"
NOTE:
METER BOX OMITTED FOR CLARITY
BRASS NIPPLE
BRASS NIPPLE
CURB STOP
CURB STOP
METER COUPLING
METER COUPLING

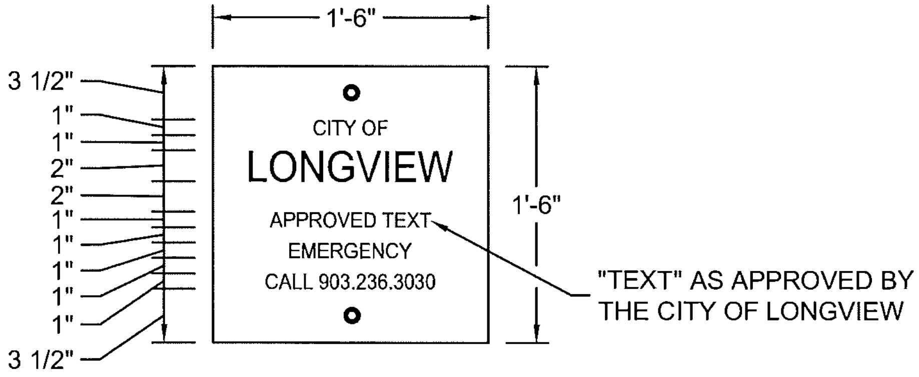
PLAN VIEW


CITY APPROVED PLASTIC METER BOX
TO BE INSTALLED AT GRADE FOR
NON-PAVED AREAS
BOX SHALL BE CITY APPROVED TRAFFIC
RATED CDR BOX IN PAVED AREAS
CURB STOP
90° BEND
METER COUPLING
METER COUPLING
CURB STOP
90° BEND
A
*
POLY (TYP)
30"
METER AND
CURB STOPS
17"
90° BEND
AMES MODEL1000
DCV GPM
DETECTOR CHECK
VALVE ASSEMBLY
DIAMETER AS
REQUIRED
COMPRESSION
CORPORATION
90° BEND
90° BEND
COMPRESSION
CORPORATION VALVE
90° BEND
CONCRETE
BLOCKING
FLANGED
COUPLING
ADAPTERS
A
1 1/2" TO 2" BRASS
BUSHING REDUCED TO 5/8"
OR 1" WITH BRASS NIPPLE
SECTION A-A
CONCRETE
BLOCKING

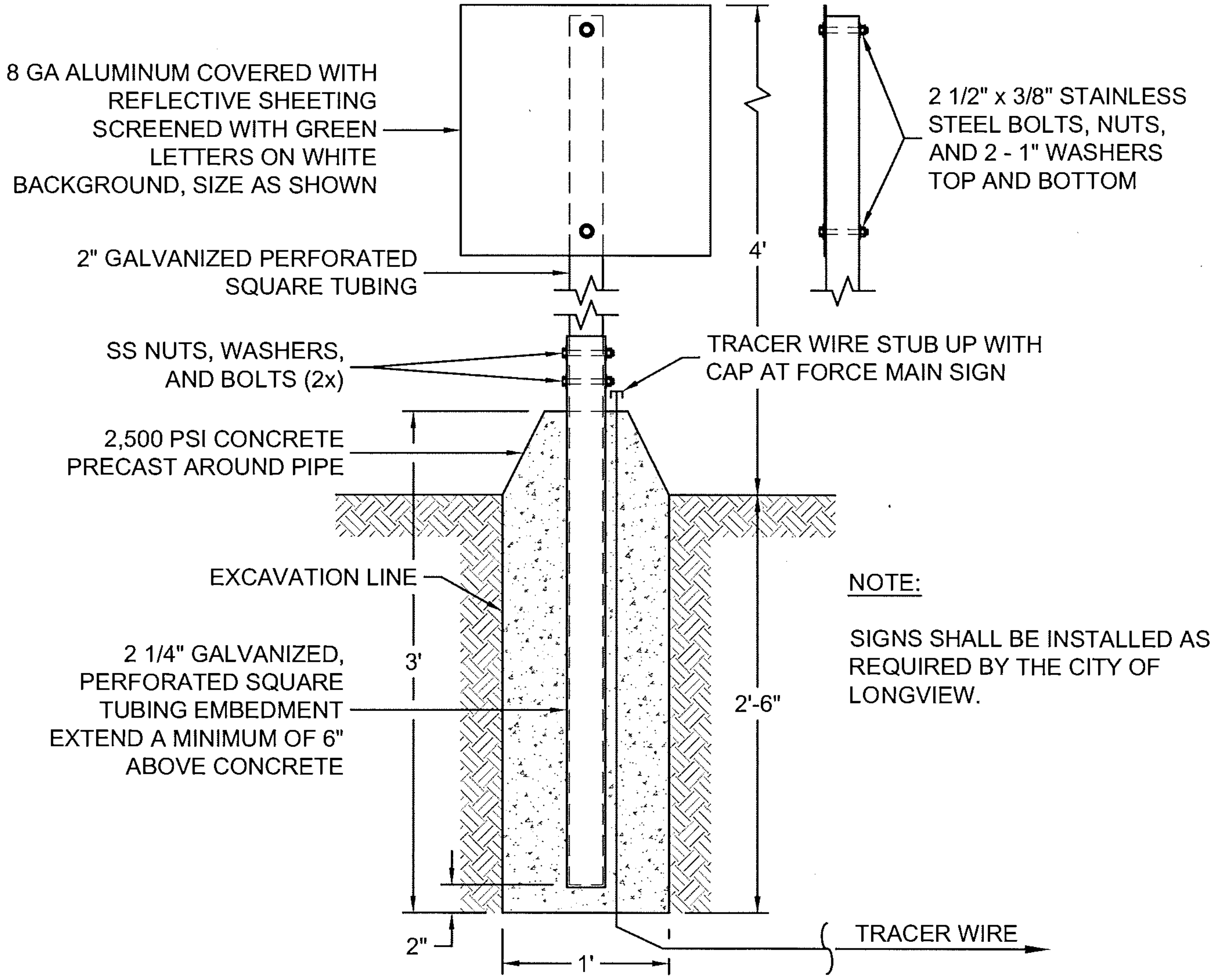
ELEVATION VIEW

*POLY TUBING SHALL BE PE 4710 ENDOTRACE PIPE

WATER	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	FIRE LINE DETECTOR CHECK VALVE ASSEMBLY
LATEST REVISION: 8/21/2019		


1'-6"
3 1/2"
1"
1"
2"
2"
1"
1"
1"
1"
1"
3 1/2"
CITY OF
LONGVIEW
APPROVED TEXT
EMERGENCY
CALL 903.236.3030
1'-6"
"TEXT" AS APPROVED BY THE CITY OF LONGVIEW

MARKER SIGN LAYOUT


8 GA ALUMINUM COVERED WITH REFLECTIVE SHEETING SCREENED WITH GREEN LETTERS ON WHITE BACKGROUND, SIZE AS SHOWN
2" GALVANIZED PERFORATED SQUARE TUBING
SS NUTS, WASHERS, AND BOLTS (2x)
2,500 PSI CONCRETE PRECAST AROUND PIPE
EXCAVATION LINE
2 1/4" GALVANIZED, PERFORATED SQUARE TUBING EMBEDMENT EXTEND A MINIMUM OF 6" ABOVE CONCRETE
3'
2"
1'
4'
2'-6"
2 1/2" x 3/8" STAINLESS STEEL BOLTS, NUTS, AND 2 - 1" WASHERS TOP AND BOTTOM
TRACER WIRE STUB UP WITH CAP AT FORCE MAIN SIGN
TRACER WIRE

NOTE:

SIGNS SHALL BE INSTALLED AS REQUIRED BY THE CITY OF LONGVIEW.

	WATER LATEST REVISION: 3/20/2018	CITY OF LONGVIEW, TEXAS STANDARD DETAILS	MARKER SIGN DETAIL

\\ksa-server3\P Drive\Projects\LV350\00.07 CAD\02 Project\30 Sheets\LV350 - C - DT - WATR - MARKER SIGN.dwg